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EDISON ELECTRIC INSTITUTE BULLETIN

Customer Prosperity Is Our Business . . . ROBERT G. ELY 281

Electric Utilities and Southern Progress
THOMAS W. MARTIN 285

"What's the Job" in Rural Electrification 288

Dispersion Factor in Depreciation Accounting
A. W. HASTINGS 289

Improved Production with Electric Heat . E. L. KAVANAUGH 293

Five Years of Fatal Accidents in the Industry Point the Way to Prevention . . . . D. C. STEWART 297

Employee Information and Education . . GERALD S. DAILEY 303

Utility Radio Cooperation Expanding 307

Accident Prevention Committee Meeting 308

Personals 309

Conventions and Meetings 312

PUBLISHED MONTHLY BY EDISON ELECTRIC INSTITUTE

ELECTRICAL RESEARCH STATISTICS
THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

May, 1946-1947

SOURCE AND DISPOSAL OF ENERGY (In Kilowatthours)—MONTH OF MAY

	1947	1946	%
GENERATION* (Net)			
By Fuel Burning Plants	13,386,998,000	10,576,709,000	+26.6
By Water Power Plants	7,389,296,000	7,098,693,000	+ 4.1
Total Generation	**20,776,294,000**	**17,675,402,000**	**+17.5**
Add—Net Imports Over International Boundaries	117,485,000	152,571,000	−23.0
Less—Company Use	128,755,000	121,616,000	+ 5.9
Less—Energy Used by Producer	387,498,000	151,601,000	.....
Net Energy for Distribution	**20,377,526,000**	**17,554,756,000**	**+16.1**
Losses and Unaccounted for	2,767,252,000	2,490,267,000	+11.1
Sales to Ultimate Customers	**17,610,274,000**	**15,064,489,000**	**+16.9**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of May 31st			
Residential or Domestic	30,437,147	28,811,595	+ 5.6
Rural (Distinct Rural Rates)	1,451,377	1,289,116	+12.6
Commercial or Industrial:			
Small Light and Power	4,822,212	4,543,709	+ 6.2
Large Light and Power	182,697	168,119	
Other Customers	129,485	120,080	+ 7.8
Total Ultimate Customers	**37,022,918**	**34,932,619**	**+ 6.0**
KILOWATTHOUR SALES—During Month of May			
Residential or Domestic	3,436,723,000	2,993,928,000	+14.8
Rural (Distinct Rural Rates)	514,294,000	378,832,000	+35.8
Commercial or Industrial:			
Small Light and Power	2,994,162,000	2,577,614,000	+16.2
Large Light and Power	9,374,837,000	7,869,409,000	+19.1
Street and Highway Lighting	165,411,000	160,382,000	+ 3.1
Other Public Authorities	475,139,000	462,724,000	+ 2.7
Railways and Railroads:			
Street and Interurban Railways	380,118,000	369,152,000	+ 3.0
Electrified Steam Railroads	223,795,000	201,271,000	+11.2
Interdepartmental	45,795,000	51,177,000	−10.5
Total to Ultimate Customers	**17,610,274,000**	**15,064,489,000**	**+16.9**
Revenues from Ultimate Customers	**$310,024,600**	**$275,606,100**	**+12.5**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—for 12 months ended May 31, 1947			
Kilowatthours per Customer	1,377	1,283	+ 7.3
Average Annual Bill	$43.38	$42.60	+ 1.8
Revenue per Kilowatthour	3.15¢	3.32¢	− 5.1

(*) By courtesy of the Federal Power Commission.

Vol. 15, No. 8, EDISON ELECTRIC INSTITUTE BULLETIN; published monthly. Entered as second-class matter Aug. 1, 1933, at the post office at Philadelphia, Pa., under the act of March 3, 1879. Publication office, 56th and Chestnut Sts., Philadelphia, Pa. Editorial office, 420 Lexington Ave., New York, N. Y. Subscription rate $2.00 per year in the United States; $3.00 per year in foreign countries.

The Edison Electric Institute does not assume responsibility for, nor necessarily endorse or approve, statements made by contributors to the BULLETIN.

EDISON ELECTRIC INSTITUTE BULLETIN

Volume 15 AUGUST, 1947 No. 8

Customer Prosperity Is Our Business!

By Robert G. Ely

Public Service Electric and Gas Company of New Jersey

A speech presented before an Industrial Section Meeting of the Pennsylvania Electric Assn. at Hershey, Pa.

RECENTLY, in the space of two or three days, the newspapers carried stories of the President's campaign to reduce prices and a statement that he was against tax reduction this year. They carried the Secretary of the Treasury's statement that national income would drop $8,000,000,000 if the President's price policy were followed. They carried simultaneous stories of pressure on industry by their employees for another round of wage increases and the granting of an additional 15 cents per hour for at least two large segments of our industry. They also carried stories of declining demand for products of the soft goods industries, the wine, whisky, costume jewelry, small radio and tire industries. In the near future there may be many others added to the list.

Will Bootstraps Work?

Visualize, if you will, the position of your industrial customers confronted with action of these seemingly contradictory economic forces which are now at work. The indication is one of growing predicament for many industries from which they will need to extricate themselves if they are to survive. Frankly, it looks as though many of them would have to pull themselves out of their difficulties by their bootstraps.

Did you ever try it? I did the other day on a fishing trip when I got quite thoroughly mired in some swampy ground. Each time I tried to free one foot, the other sank in a little deeper. Finally, I lost my balance and fell flat on my face. That's just where many of your industrial customers are going to be too if they don't get some help from you.

In providing assistance you will do far more than assure your company of continued industrial sales revenue. It will do more than assure continued residential and commercial sales incidental to the employment and payrolls of the industries you help.

What I'm getting at is this, Today, much of the pioneering which distinguished the industrial growth of this country has given way to the dependence on the Federal Government for the solution to many economic and business problems. Businessmen and employees alike have sacrificed much of their freedom and independence for the false security of Federal policy and edict.

The result has been the tremendous growth of the Federal Government as a partner or competitor in many lines of business. Our business is no exception and recent figures indicate that politically managed utilities will soon be producing nearly 20 per cent of the total electric energy generated by utilities.

Reduced to fundamentals, such competition in our business reflects the wishes of a large segment of the people. They may be divided into three groups: those who derive immediate personal benefit by political management; those who feel that business managed utilities should have assumed more leadership in solving community probems, and those who are apathetic.

First and foremost, we have a job ahead of us and that is the job of selling the country on business management in the utility industry.

The job of selling business management, of selling the value of our companies, does not mean long and labored discussions of a highly theoretical nature on economics, tax advantages, Communism, Socialism, or the Nationalization of the British Utilities.

The job ahead is more than the sale of reliable service at reasonable rates. We must work constantly to develop our communities into better places to live and work. When we have assumed a larger share of the responsibility for the economic health of the communities and the prosperity of the customers we serve, people will no longer be apathetic. We will be supplying that leadership which is so essential, and the pressure for political management will disappear.

Many of you have heard of the "Better Home Towns Program" of the Georgia Power Company, the "Territorial Development Program" of the Monongahela Power Company, and the "Community Betterment Through Industrial Development Program" of the Empire District Electric Company. These programs and several others are pointing the way. Designed as they are to improve local communities, increase ratables, increase industrial, residential and commercial sales through territorial development, these programs are doing much to cement good public relations.

Community Help Programs

D. C. McKee, Vice President and General Manager of the Empire District Electric Company, said recently at a Missouri Valley Electric Association meeting that in 25 franchise elections since his company embarked on their program that 18 elections had been unanimous and that in the other seven, only 100 adverse votes had been cast. In a large city, another company with a very active program reported that the leading newspaper had interceded with city officials then pressing for a large rate reduction, because the electric utility company—singlehanded—was doing more for the city with their program than any other agency and the newspaper was

A Joint Session of the Industrial Power and Heating Section of the EEI and the Pennsylvania Electric Association at the 1947 Power Sales Conference at Hershey, Pa.

anxious to see the matter settled quickly and equitably. You can't buy that kind of confidence, you have to earn it!

The March 27 and April 10 issues of the Public Utilities Fortnightly carried an interesting article by H. W. Oliphant on the subject, entitled "Moving the Masses in the City of Tomorrow." Mr. Oliphant points out that large sections in many of our best cities are in a semi-decadent state, primarily because of transportation problems, and that community planning and rebuilding is essential to their rehabilitation.

Some of you who come from large cities may have a real problem in the decentralization of industry unless positive action is taken in territorial development work. The large cities with adequate school systems and water, sewage, police and fire protection facilities may lose ratables with which to support these services. Decentralization has gained momentum since the war, creating problems for some small communities that were never designed to support industry, and these communities are often faced with the serious problem of expanding such services without adequate increase in ratables.

It would be possible to discuss, at length, the value of programs which stimulate a community's interest in its own betterment and development and provide help to reach that goal. I have only time to recommend that you support such programs with earnestness. It is not a one-man job, but an all-company job in which each employee has a part.

In many utility companies, territorial development and power sales are tied closely together. Through these two phases of our business the greatest good can be done as the continued growth of your present industries and the securing of new industries in the area are two important phases of territorial development.

The last twelve months and the remainder of 1947 will be known as one of the most restless periods of industry. Plants have moved from their old homes to "greener pastures" in an effort to seek relief from many of their problems. In the consideration of a new location, industry may place high emphasis on a reliable power supply, but from a cost standpoint power supply is only thought of after due consideration of markets, labor, transportation, raw materials, factory sites, taxes, etc.

Just look at the extent to which people can go when they are relatively uninformed on the subject. The *Boston Daily Record,* in an editorial on December 10, 1946, decrying the loss to New England of the expansion of eight of their former textile industries in the South, attributed much of what was happening to the development of "cheap and abundant hydroelectricity from dams and reservoirs financed in large part with New England tax money." It stated that "New England is doomed unless it harnesses and uses the waterpower that is going to waste in its rivers and obtains its rightful share of low-cost electricity from the St. Lawrence."

On actual investigation, it has been found that not one of these firms attribute their expansion plans at the location selected to variations in power cost.

The expansion and relocation of industry today are so widespread and seem of such an urgent nature they may foretell an impending crisis in the business situation. It seems strange to suggest a crisis in industrial activity when we representatives of utility companies are experiencing an unprecedented "new industry boom" and great expansion on the part of present customers. It seems strange to worry about such a crisis when we are hard-put to obtain sufficient generating and distribution capacity to supply the tremendous backlog of new business on our books for 1947, 1948 and even later.

Your field is primarily in work with your industrial customers. The success of your industry, of course, depends primarily on its ability to manufacture goods at a competitive price level, sell them at a fair profit, and set aside sufficient reserves to carry through slack business periods.

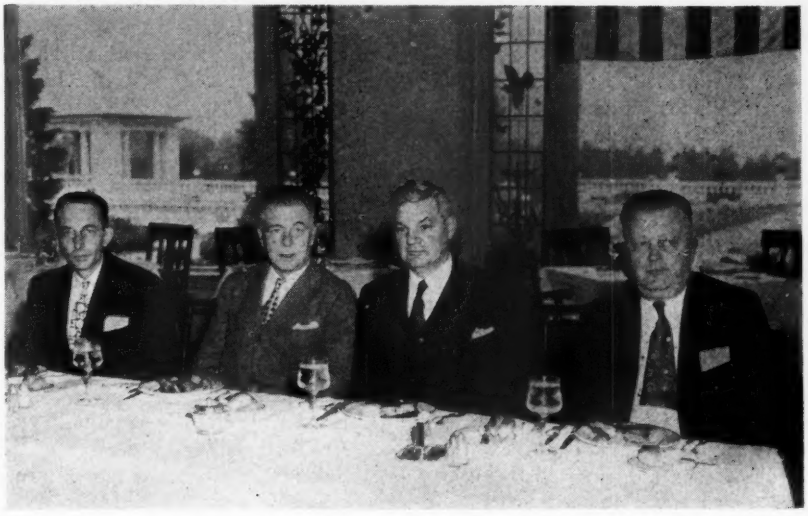
What's Troubling Industry?

Let's take a look at the problems that trouble industry today. They stem from increased sales resistance to high prices, which it is necessary to charge for products because of raw material costs, outmoded production methods, transportation costs, present wage levels, and labor productivty. They also stem from the continued shortage of some vital materials, tending to increase inventories of available materials and semi-finished products and thereby reducing working capital to critical levels. The buyers' market for many products has arrived and many of our new companies have in the past sold only to the Government or to a public no longer brand conscious because of shortages.

Economic theory!—perhaps, but in February a receiver was appointed for a firm in our territory making refrigeration equipment. This was not due to a lack of orders, but because the inability to obtain sheet steel and continuing plant overhead depleted working capital. A plastics powder manufacturer recently curtailed an expansion program and of-

fered new equipment for sale because excessive inventories were allowed to accumulate during a slack sales period and sufficient capital reserves had not been accumulated. An insulator manufacturer recently went into receivership and one of the contributing factors to this failure was inability to contract war-expanded production facilities into a smaller, compact and efficient production unit for the lower peacetime volume of production. During the coming months you will be able to multiply these experiences many times.

What does this lead to? What service can we industrial salesmen give our customers to help them weather this uncertain period—to help them grow into well-established enterprises contributing greatly to the stability of our communities, free of political interference and meddling, and strong advocates of private enterprise? Their problems are concrete, they are immediate and we are in a good position to be of inestimable assistance.



Left to Right: Messrs. G. E. Duerr, Chairman of the Industrial Power Committee of the Pennsylvania Electric Association; Francis McQuillin, West Penn Power Company; Charles E. Oakes, President, Edison Electric Institute; and Charles Snyder, Chairman of Industrial Power and Heating Section of the Edison Electric Institute, at a luncheon meeting of the 1947 Power Sales Conference at Hershey, Pa.

Must the Patient Die?

To do it, we are going to have to know more about our customers' business problems. We are going to have to know more about our customers' production methods. We are going to have to study them for every possible economy which can be made. This is the only way we can get at the root of our customers' problems and be of real assistance.

Perhaps my thoughts can best be illustrated by an experience two of our power salesmen had many years ago. A flour mill in the territory was considering the installation of a Diesel engine to reduce overall costs. Power costs were not the basic trouble, but we were in a depression period, the plant location in this eastern area was not too conducive to profitable operation, and it is possible that some processing methods were outmoded. The power salesmen called several times and were successful in convincing the customer that Diesel engines could not compete successfully with our service. Finally the customer looked at our two men and said, "Gentlemen, you remind me of callers at the hospital. You come in quietly and politely; you bring candy and flowers; you do everything to cheer the patient up. But then, what happens? The patient dies!"

Here was a customer telling us clearly that he needed help. His basic trouble was not power cost, but economic conditions and production methods. The firm is still a customer, but in this case I am sure he solved his own problems without our help.

We should have been able to do something in that plant to lower production costs. No clearer call for help could be given, and I feel quite sure that today a similar experience woud not be repeated.

In 1944, the Edison Electric Institute through its Industrial Section published a chapter for the POWER SALES MANUAL on Production Method Analysis. It tells in simple terms the basic fundamentals of Methods Engineering—that type of engineering so essential to the increase of industrial productivity.

Make Use of Methods Engineering

I am not going to review these fundamentals with you today. You can get far more by a study of the manual than you could by hearing me review it. There are some cases shown in detail where power salesmen were successful in helping their customers reduce manufacturing costs. Some of you can also cite from your own experiences. There may be others among you who have had some qualms about trying out the analyses suggested. You may feel unqualified to break down your customer's present manufacturing methods. You may hesitate to display ignorance of the fine points of your customer's business. In short, you may lack self-confidence. You may also say we're not interested too deeply in time studies, motion and micromotion studies, man and machine charts, operator process charts, and wage incentives. On these last items only, I agree with you.

I know of no more capable group of men to analyze customers' production methods than power salesmen. I know of no group of men with broader knowledge of the applications of electricity which are essential to the complete mechanization of industry. I know of no group of men better able to study the delivery of raw materials to a customer's plant, examine their storage and flow through the various processing and packaging operations to final shipment than power salesmen.

Like anything else, it's hard to get started on the right course. In this connection, I would like to make one suggestion. Study your customer's materials handling system. It is the door opener for your examination of his plant. Improvement in a customer's material handling methods will show large dollar savings and uncover processing methods improvement at the same time.

Economic Short-cuts

The other day I was in the plant of a large food processor. The materials handling system from the introduction of raw materials on through processing was as fine a system as you would want to see—right up to the loading of cartons in the freight car for shipment. At this point, electric fork trucks were depositing pallets on hand trucks, two men wheeled the trucks into the freight cars

and then loaded the car by hand. It was an obvious job for the new depalletizer, written up in the February issue of *Electrified Industry*. The story has two points: first, the customer can save on handling costs; second, in a large, modern plant with a splendidly designed handling system, it was still possible for a power sales engineer to make an intelligent suggestion for methods improvement.

A small company in the territory makes a product requiring the delivery of acids and oils in drums, and salt shipped loose in freight cars. The drums were unloaded and stored by hand and five men with wheelbarrows took two days to unload one car of salt. The salt was dumped on the floor and then conveyed to hoppers. After examination of the job by our men, an electric scoop truck has been ordered. The truck will dump the salt in the hoppers in one operation and when unloading is finished, the scoop will be unfastened and the truck will be used for storing and stacking drums of oil. The truck will also save storage space, as the finished product will now be stacked to the ceiling.

Service Not Wanted

Not all of your experiences with better methods will be successful. There was a lighting fixture man in our territory making fluorescent fixtures. Four men worked at each bench, each responsible for the complete assembly of a fixture. An electric solder pot was placed some fifteen feet away from the head end of the work tables and periodically a man would walk to the pot and dip a set of leads. The power salesman, fresh from a study of methods engineering, suggested the installation of a small electric pot at each work place on the table to eliminate the constant travel to the central pot. The customer was appreciative of the suggestion, but pointed out that under existing contracts, production was limited to eight units per man per day. For that reason he could not justify the expenditures necessary.

Then there was the fountain pen manufacturer where our man's permission to study the plant, given by the owner's son, was rescinded by the owner when he learned of it an hour or so later. The business is highly competitive and he was afraid our men would carry away firsthand knowledge of one or two new and highly critical operations. Our man was not called off, however, until he had uncovered some backtracking in the materials handling system which could be corrected to advantage by better machine positioning.

In a recent talk at the National Sales Conference of the Edison Electric Institute, H. B. Maynard, President of the Methods Engineering Council, defined methods engineering as "common sense systematically applied" with the questioning attitude and the question—WHY?—as the principle technique. At the same meeting, J. O. Sheahan, of Drake, Startzmann, Sheahan, Barclay, Inc., in pointing out that mechanization was the way to increased production, cited five fundamental materials handling principles:

1. Handle materials in large units.
2. Avoid rehandling.
3. Balance the productive rate of men and equipment.
4. As equipment sets the pace, select equipment suited to the needs.
5. Move materials in a straight line and eliminate back and cross hauling.

Just remember in your work to improve customers' production methods that unnecessary handling of materials adds to the expense of your customers' products without adding value.

We have heard a great deal about labor productivity and I'll warrant that the mental picture of everyone of us focuses on some manufacturing or construction operation. We see some operations which we know or feel could be done more effectively with energetic and competent labor or some process change. We know that increased production is the key to increased profits or the maintenance of profit margins in the face of present-day labor and material costs.

Did you ever stop to think that this same theory can be applied to your work and mine in the sales field? One of the greatest troubles about such a talk as this is that the admonitions seem to apply so aptly to the fellow in the next row—he can't mean me. But I do!

To do your job effectively during the next few years, you're going to have to put your heart and soul into the job of selling your company, a business managed enterprise, to the people of your community. Let us remember as we go about our daily work that we are the companies we represent, that we in industrial sales work have an opportunity as well as a challenge to earn the complete confidence and respect of our customers and the general public through our activity in community development programs and methods engineering to help our customers lower costs and increase production. We will be able to measure the results of our efforts with improved public relations and with substantial increases in our industrial, residential and commercial revenues. Customer prosperity is our business!

New Officials Elected at Northwest Association Meeting

THOMAS E. ROACH, executive vice-president and general manager, Idaho Power Co., Boise, was elected president of the Northwest Electric Light & Power Association at the annual meeting at Vancouver, B. C., June 27, 1947. W. L. Thrailkill, The Washington Water Power Co., Spokane, was re-elected vice-president of the Association.

Mr. Roach, who took his new position with Idaho Power from the Northwestern Electric Co. on July 1, succeeds as president of the Association James H. Polhemus, Portland General Electric Co., who held the office during the past year.

State vice-presidents elected at the meeting were: Idaho, C. J. Strike, Idaho Power Co.; Montana, J. E. Corette, Jr., Montana Power Co.; Oregon, E. F. Pearson, Pacific Power & Light Co.; Utah, R. H. Ashworth, Utah Power & Light Co.; Washington, H. C. Webb, Puget Sound Power & Light Co.; and British Columbia, T. M. Moran, B. C. Electric Railway Co.

Members-at-large of the Executive Committee to represent the utilities are: J. A. Hale, Utah Power & Light Co., Z. E. Merrill, Mountain States Power Co., and James H. Polhemus, retiring president.

Both members and alternates on the executive committee to represent manufacturers, wholesalers, contractors and dealers were elected as follows: Members, John F. McDaniel, Hotpoint Inc., Seattle; Dean Pulsifer, Westinghouse Electric Supply Co., Seattle; R. B. Lane, Industrial Electric Co., Seattle; Joseph T. Krivanek, Krivanek Electric Co., Longview, Wash.; alternates, W. D. Robertson, Canadian General Electric Co., Vancouver, B. C.; A. L. Shellworth, Sunset Electric Co., Portland; Grover C. Burke, City Electric & Fixture Co., Seattle, and Arnold Kuhnhausen, Kuhnhausen Electric Appliance Co., Portland.

Electric Utilities and Southern Progress

By Thomas W. Martin

President, Alabama Power Company

An address before a meeting of the Southeastern Electric Exchange at St. Petersburg, Florida

THE subject of southern industrial development, and the responsibility of the utilities for the future development and prosperity of the South is far too extensive for this occasion.

Therefore, I can only attempt to discuss, and in a limited way, the place of the electric utilities in the progress of the region. After all, you of the electric utility group are well aware of the notable progress of the region since the turn of the century, and of the part played in its development by the railroads and the electric and gas utilities.

Prior to 1900 the South was predominantly an agricultural region. Near the turn of the century, the importance of electric power to the progress of the region began to be generally recognized.

The transmission of power over relatively long distances was being perfected. Industries no longer were forced to locate at waterfalls or near coal mines. Through transmission of power every community would have equal opportunity to grow and develop its own resources of men and materials.

Surge of Electric Power in the South

During the past few decades the South has experienced marvelous growth in industry. Not only have old industries expanded, but a wide variety of new industries have been developed throughout the region. Its resources of climate, water, raw materials and labor have offered inducements to industry, to expand and to establish here; but the development and transmission of electric power throughout the region have been the most significant factors in the change from a strictly agricultural economy to a more industrialized system.

Electric power has contributed not only to the increased wealth of the region but has brought to many who otherwise would have done without the comforts and conveniences of modern civilization, by extending the use of electricity to thousands of homes on the farms and in the cities and towns to lighten the burden of the farmer or housewife, and by increasing the volume and cheapening the cost of manufactured products.

All of this did not come about without the thought and planning of many men. For decades men of the South had faith and confidence in their section and hope for its future; few had in addition, that magnetic quality that would enable them to influence great sources of capital to engage in creating something out of the latent forces of nature.

Industrial Giants of the South

Onto this southern scene came such men in the early part of the century as James B. Duke in Carolina; Jo C. Guild, Sr., in Tennessee, H. M. Atkinson and P. S. Arkwright in Georgia; Captain W. P. Lay, the Mitchells in Alabama; Harvey C. Couch in Arkansas and others. They were men of destiny and rightly may be considered pioneers in this field. Later came other outstanding examples of leadership in southern affairs, such as Jack Holtzclaw in Virginia, and A. B. Paterson in Louisiana.

In each section, one of them arose to inspire other men and the events which followed. What they effected and achieved was important; but more important, was their spirit, their character, their talent to translate fancy into fact.

Perhaps they foresaw the future dimly, but they did see those opal-tinted visions in the turning of the economic tides of which Henry Grady spoke decades before.

We have every reason to be proud of these pioneers. They were men on the whole "who spoke little and did much." But their reticence should not be permitted to obscure the social importance of their thinking.

The historian has been prone to select an incident or phase of development in America, whether it be industrial, or railroad, or utility, and to draw unfair conclusions as to the social importance of the dramatic development of the period and of the thinking of the men who brought it about. The real weakness, as one writer recently said, in our historical treatment of those things, is ignorance of the motivation and philosophies of these men of action.

Instead of making special effort to understand the business man, the scholarly reaction has too often been rather an attitude of superiority and disdain for his ideas, until we are now confronted with the question: Has the record of business thinking been lost through generations of neglect?

From my own study and contact of nearly 4 decades with the electric power industry in the South, I believe it may be possible to discover something of the forces that motivated them; that is, the interest of those entrepreneurs in the region and in their fellowman.

No region can measure its future that does not know its past; and one may well ask just how much does the average citizen know of the toil, vision, the brain, brawn and sacrifice spent in creating the power facilities of the southeast.

It was realized that if power was to be cheap, it had to be generated in large volume and transmitted by high voltage lines to centers of distribution, thus employing the principle of mass production and mass distribution. As plants and systems were developed, they were connected and integrated with one or more other systems.

Electric Power and Society

The electric companies of this region have kept pace with the rapid change in technology of the art and have through their leadership promoted much of the vast industrial growth of the past several decades. They are noted for leadership in the interconnection and integration of power sources, beginning with the first of such connections between the Georgia Power Company and Southern Power Company in 1912.

Each step of this development has been planned with the view of obtaining fullest use of power resources, and of giving the best possible service through a network of power transmission lines. All of this has enabled them to contribute in a large way, directly and indirectly, to the educational and social programs of the region.

Perhaps in time, an objective study of electric power development in the Southeast will be made from source material which should still be abundant in the records of southern utility companies. In

such studies the entrepreneur will be permitted to explain his motivation; his interest in his fellowman and his concern broadly for the region.

And we need boldly to proclaim, particularly to the young men who would enter the electric industry, not only the satisfaction but also the accomplishments of these illustrious sons of the South under the capitalistic system which is the democratic way of life. Its contributions in the recent world conflict rightly brought many expressions of acclaim; but its contributions to the peacetime life of the South form the basis of much of our social gains for the past fifty years.

We to whom the torch has been passed have a sense of the trust which for a little time we are privileged to guard, and that trust includes the faith and dream of those pioneers—men of destiny.

Interested in Everything

In the active lifetime of most of us, business as a whole has entered a new era of economic and social relationship. In this the electric industry was foremost. The incident is told of Thomas Edison that when he registered on one occasion he was asked in what he was interested. Here, Mr. Edison wrote "Everything."

More and more the public have come to look upon the individuals in our industry just that way; for we are called upon to take interest as citizens in practically every community enterprise.

On the other hand, we have all learned that we serve many different publics, and these publics in turn have become more and more interested in the businesses which serve them. No longer de we concentrate all of our efforts on production and distribution. We have come to realize that our interest extends far beyond the immediate transaction.

The public in general, as well as our customers, are awake not only to what is going on in our business, but are also utilizing their prerogatives as judge and jury concerning the activities in which we are engaged.

The South was once a land of many handcraft enterprises; we, just as other areas, went through a sort of industrial revolution, taking production from modest plants and homes and putting them under factory roofs and production lines. Then much localized business and industry gave way to large-scale mass production, again marking great social-economic changes.

And now, in this decade we are living in the midst perhaps of another era in which the management of business and industry is accepting a broader concept of responsibility to the public they serve. This should mean that the public will enjoy the benefits of mass production and large-scale operation, such as we must have in our business, and at the same time have the advantages of the type of personalized relationships that existed in the days before industry became national in scope.

We are called upon to render to the public more and more of those "plus services," beyond the routine of duty or obligations, which are so important for the building up of communities.

These are valuable services—valuable to the community and valuable in helping to make our customers aware of our good intentions and high stewardship. And it has been especially interesting to see how valuable these *"plus* services" have been in developing public good will towards our business.

Looking to the future, I believe that the growth of the electric industry will exceed any period of the past. Every effort should be made to attract well-trained young men to go into the business and to have them realize the opportunities the industry affords them, both for their own advancement and for the advancement of the region.

Economic Unity in Your Community

New relationships with government and the public require not only a new alertness on the part of officers and employees, but they also require that we keep step with change.

To keep pace with the rapid changes taking place all about us, it is no longer sufficient to be merely a good manager. The test today lies outside the plant and office, more than it lies in rendering good service at a satisfactory annual profit.

In fact, the successful company today is one that not only renders good service, but is publicly recognized as the agency that makes a business of actually increasing the prosperity of every community it serves.

It is obvious that the economic progress of any area can only be assured by promoting the growth of the income and the payrolls in each of its communities; and no group has to the extent of the electric industry stepped out everywhere in the South as the explicit promoter of the communities it serves.

By this, I mean well-ordered procedures, worked out in cooperation with the citizens of the community, that actually create new income and new payrolls. The electric industry is everywhere linked with this worthy goal and is supporting those things which make for progress.

It has been apparent for decades that the southern region did not process a sufficient volume of goods for the consumer and that it lagged behind in scientific industrial research. Value added by manufacture per wage earner is greatest where the preponderance of such research is done.

Every state of the South in this respect is far below the national average. Without science and technology available to small industries which have no laboratories, further progress would be very slow. The fortunes of the utilities being closely tied with the progress of their service areas, many of them recently joined with others in the creation of a non-profit research institute. It now exists in Birmingham as Southern Research Institute, equipped with laboratories, a director, and a staff of trained scientists, and it is doing a great service to southern industry, and, indeed, to the region as a whole.*

Is Natural Wealth Necessary?

Many southern speakers tell us about the unparalleled natural resources of the South; but if we rely upon them alone to take care of us we shall continue to be hewers of wood and drawers of water.

Other areas have built their prosperity to a high level without the great natural wealth that is inherent in the lands and crops of the South. For example, a distinguished speaker from Boston said recently, in discussing the New England system of economy, in an address at Birmingham, that his section was forced to make up through research and invention and industrial development for a lack of natural resources, such as are found in the South.

Industry grows up around the research laboratory; and expanding southern industry is recognizing more and more the importance of research and the development of new and improved products. They must be produced in large quantities and at low costs—and I firmly believe that they will be produced in ever-increasing volume.

In my limited time I cannot present in an adequate way a statistical study of the growth of the region. It is most impressive and means much to us of the electric industry, for we have had a most

* The annual report for 1946, presents a review of the work of the Institute. A copy may be obtained by writing to J. A. Maguire, Secretary, 600 North 18th Street, Birmingham, Ala.

significant part in bringing it about.* Taking advantage as we go ahead of the methods and means that have made other regions prosperous, there should be no limit, with our natural wealth, to our future growth and prosperity.

In the decade ahead we will see wide employment gains; new jobs created by expanding southern industry will follow in direct ratio to the growth and development of new fields and to the extent that expanding enterprise is given a healthy climate in which it can live and continue to grow.

These essentials have made America strong and have brought our standards of living to the highest of any nation; they offer the best, and in my judgment, the only satisfactory guide for the future of the South.

A high standard of living implies a vigorous interchange of goods. We are not going back to the handcraft days. Experience has shown that the people of the South promptly and eagerly adopt the newest inventions and products when they can get them. They want more automobiles, radios, electric power, books, telephones, good food, good clothing, good housing.

Education for Mind and Hand

The South's future is largely in its own markets which depend upon higher earnings of its people. These earnings depend upon greater production of finished goods, and that in turn, upon education.

Thus, education of the mind and of the hand for all the people, white and colored, of the Southeast, is in the judgment of many of our most thoughtful people, the first requisite to providing a permanent market, and hence to securing permanent higher standards of living.

The September 1946 Review of the Federal Reserve Bank of Atlanta was devoted to education as an investment in Sixth-District economic progress. It is an important contribution to southern thinking.

The writer pointed out that many plans were being devised to expand the region's industry, the success of which depends on the capabilities of all the people who work with them. Quoting from that article:

> "Many communities neglect to consider the direct relationship between ignorance and poverty on one hand and between education and economic progress on the other. In an effort to attract new industries to their communities, people frequently go into great detail about physical resources. They give the type, quality and quantity of raw materials, and seldom give the average educational levels of the labor forces.
>
> Yet, frequently, the community's economic position today is the result of the type of education it provided yesterday. Its economic position tomorrow will be largely determined by how well it is educating its children today."

First Consideration

Today, in the South, education is demanding and is receiving first consideration throughout the region—as we realize that its improved economic position tomorrow will be largely dependent upon better educating the children of today.

The *Miami Herald* of March 25, 1947 contained a statement by the President of the General Education Board concerning its work in promoting education in the South. This language was used:

> "One need present no argument to establish the fact that the South, despite its known potentialities and its recognized achievements, lags seriously behind the rest of the United States in many essentials.
>
> "Whether measured by available investment capital, effective economic opportunity, personal and public incomes, state and local political administration, health and social welfare, or educational facilities, the comparative position of the southern region is one of disadvantage."

It rather shocks us to have our situation presented by an impartial agency in that way, and an effective voice might well point out the progress and achievements of the region in overcoming these deficiencies. However, we of the South do not have such an effective voice. Perhaps there should be a Chamber of Commerce of the region, or some kind of a joint economic board to present its achievements and to make a study of measures to further improve and expand the economic welfare of the region.

We should be looking to the future and to the goal of a thoroughly rationalized economy; involving not only an interchange of goods between the South and the other regions of our own country, but a thriving foreign trade as well.

Every generation hands down to the next a heritage of achievement; also a heritage of unfinished business. Much has been achieved; and most of us who live in the South would like to have a hand in carrying on the unfinished business that is our heritage.

A distinguished writer once said that "The South should be one of the very lovely lands of the world." To make it so, we must improve the use of our natural resources through the application of science; and we of the electric industry must continue our efforts to stimulate industrial activity.

The South has emerged from the effects of the war strong and virile. In my opinion, we are in the midst of our greatest period of industrial expansion. Everywhere I go in the South there is genuine and active interest both in home-owned and in branch plant operations. This interest is many times what it was in prewar years.

There is an ambition among southern people as never before to do many things. This should continue and will continue so long as local and state governments maintain a healthy climate for industrial expansion; for expanding industry through free enterprise is the hope of the South, as in the days of our illustrious pioneers.

In the words of the poet—

"Let science and machinery and trade
Be slaves of her and make her all in all."

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* Anyone interested in southern progress may read with profit the recent address of Maj. Gen. John C. Persons, President of The First National Bank of Birmingham, under the title, "The Awakened South," before the Birmingham Traffic & Transportation Club. Copies may be obtained by writing Mr. Arthur J. Ribe, President, Birmingham Traffic and Transportation Club, Inc., 600 Woodward Building, Birmingham 3, Ala.

EEI Publishes Water Heater Installation Manual

AN Electric Water Heater Installation Manual, which illustrates the principal wiring methods and other installation practices now used with electric water heaters throughout the country, has been prepared by the Wiring Committee of the Commercial Division, Edison Electric Institute, and published by EEI.

The Manual, which is the first section of a comprehensive Appliance Installation Manual to be prepared by the committee, to cover those appliances requiring a specific type of installation work, pictures the major variations of electric and plumbing connections found in the industry, according to R. F. Hartenstein, committee chairman.

A total of eight electric water heater installation methods as developed for use with one meter are shown, together with several adaptations of the two meter methods, and suggested plumbing diagrams. All installations covered utilize the standard two-element water heater, known as the NEMA standard.

"It is hoped that use of the Manual will eventually result in greater uniformity of installation practices among all

(*Continued on page* 306)

"What's the Job" In Rural Electrification

NOTE: The Agricultural Development Committee of the EEI Farm Section has devoted considerable thought and study to the question, "What is the rural development job?" A sub-committee of this group here sets forth in general terms, the opportunities of the electric companies to contribute to the social and economic well-being of the rural areas served.

As Agriculture Goes, So Goes Our Destiny

In order to realize a profitable return on the investment made in rural lines, and to protect that investment, an electric company must do more than generate, transmit and distribute electricity to rural areas. A comprehensive, aggressive rural development program means:

1. More revenue from rural lines.
2. More stable revenue, in times of economic stress.
3. Better public relations.
4. Improved farming and living standards for farm customers.
5. A leading position in the farm community for your company.

Agriculture Is Important to Your Company Because—

1. Eighty per cent of our population are born in rural areas, with American ideas of free enterprise and individual initiative.
2. Agriculture is the largest of all American industries.
3. The agricultural economy has a greater effect upon the national economy than that of any other industry.
4. There is a pronounced trend toward decentralization of industry to rural areas, thereby increasing the importance of rural territory to the electrical industry.

Every electric company serving an important farm area should have a Farm Service Department, with a department head in charge who is on a comparable basis with other department heads. He should be responsible for all work in connection with an agricultural development program—aimed both at properly serving the agricultural territory, and protecting your company's investment.

Scope of Program

Farm Service Department activities should include—

1. Utilization of Electricity.
2. Agricultural Development.

Utilization—Grouped under this heading are the successful application of electricity to farm uses, and the development of new types of electrical equipment to meet specific farm needs. It covers, in general, your company's efforts to help farm customers make the best use possible of electric service, to improve their social and economic status.

Agricultural Development — This work involves the initiation and direction of programs and activities designed to supplement the work of agricultural leaders and agencies, by helping them to execute their programs.

It also means taking the lead in community development activities identified with agriculture. In many areas agriculture is closely tied-in with community development work. Through such work, your company can best be established as a recognized community leader.

Examples of activities coming under the two general headings "Utilization" and "Agricultural Development" that electric companies are taking an active part in to the advantage of farm customers and themselves.

1. 4-H and vocational agricultural farm electrification projects.
2. Agricultural and industrial surveys.
3. Livestock improvement projects.
4. Soil conservation.
5. Farm contests to encourage more efficient agricultural practices.
6. Farm building advisory service.
7. Soil testing service.
8. Grading and marketing agricultural products.
9. Farm chemurgy.

Many companies do not take advantage of opportunities to work with agricultural groups in attaining the preceding objectives. A Farm Service Department, or its equivalent, staffed by agriculturally trained personnel, is essential in order to execute most effectively the entire program, including joint activities with the several agricultural agencies and groups.

Close cooperation with these organizations is essential to a well-rounded rural development program, since in practically every case, their interests are similar to those of the electric company.

Some Agencies With Which an Electric Company Can Work

Land-Grant Colleges and Universities
State Departments of Agriculture
State Departments of Education
Farmers' Organizations
Trade Associations
Civic Groups
Soil Conservation Service
Farm and Home Administration

The above list is by no means all-inclusive. In your area, there are doubtlessly many other organizations with whom you can profitably cooperate.

No one is in a better position than the electric company to know the problems of a specific area, and to assist in solving these problems. Agriculture, in many areas, is closely related to industrial and civic improvements. Electric companies serving farm areas, therefore, should consider organizing a Farm Service Department, in order to take full advantage of the many opportunities afforded through rural development.

If you are interested in securing more revenue from rural lines, protecting the stability of this revenue, improving public relations, contributing to the economy of the communities you serve, and being recognized as a civic leader, we recommend your earnest consideration of rural development as a means of attaining these objectives.—Prepared by: L. W. GRAY, *Georgia Power Company;* E. C. EASTER, *Alabama Power Company;* R. T. JONES, *Pennsylvania Power & Light Company; and* H. J. GALLAGHER, *Consumers Power Company, for Farm Section, Edison Electric Institute.*

Planned Office Lighting Program Material

THE first large-scale program on Planned Office Lighting to be supported by utilities, manufacturers and all other branches of the lighting industry is now ready for use, Ralph P. Wagner, chairman of the Edison Electric Institute's Commercial Division, has announced. A plan book outlining the promotional campaign, with sample copies of mailing pieces, sales visualizers, customer booklets and other sales aids, is now being distributed to utility commercial executives.

"Planned office lighting is a relatively undeveloped field that offers a basic, continuing and growing profit load to the utility company," Mr. Wagner declared. "The materials provided in this program are designed to help the utility sell Planned Lighting, carefully engineered for lasting customer satisfaction, and at the same time to combat the efforts of irresponsible fixture salesmen promoting questionable products, on a basis of low costs."

The Planned Office Lighting plan book is the second in the series of five major projects to be prepared in EEI's Planned Lighting Program, with those on School, Industrial and Residential lighting scheduled for release within the next few weeks, Mr. Wagner said.

Dispersion Factor In Depreciation Accounting

Has Research Lowered the Sights on What the Depreciation Reserve Requirement Would Be on Utility Plant?

By A. W. Hastings

Epsco, Inc., New York, New York

An address presented before the meeting of the Accounting Division General Committee at the Fifteenth Annual Convention of the Edison Electric Institute, Atlantic City, N. J., June 2, 1947

IT IS true that the results of recent research directed toward new methods of discovering the facts about depreciation of utility property have tended to minimize depreciation requirements computed on an age-life basis.

Before illuminating this statement, let's get some words straightened out so that we all understand what we mean by them. Depreciation as we are discussing it is essentially the collection over its life of the net cost of property, that is, cost less the net salvage value that will be realized upon its retirement, over the period corresponding roughly with the time that the property is in use.

If we omit the application of interest in this phase of the discussion, we can describe the annual depreciation charge very simply and specifically. It is the net cost divided by the estimated life in years. The accrued depreciation or the depreciation reserve requirement is the age at any date divided by the life, times the net cost. Hence the name "age-life."

This is the classical concept of age-life depreciation. It is simple, direct, and understandable. Note particularly that we say nothing about value. To illustrate, if we have an item of property costing $1,000 which the engineers estimate will last for 40 years, with no net salvage, we must collect $25 a year in order to have recovered the cost by the time the unit is retired.

Now, that computation is easy to make as applied to single units of property such as a turbo-generator unit, but when we come to apply it to a large utility property we get problems. The bulk of our property—at least 60 per cent of it—is made up of thousands of units of poles, wire, transformers, meters, etc. These are recorded in our group accounts. If we were obliged to estimate and follow individual units of property in the group accounts, the work would be tremendous. The plant accounting men already use averages for charging all kinds of property into the group accounts and we might be expected to deal likewise with averages in depreciation computations.

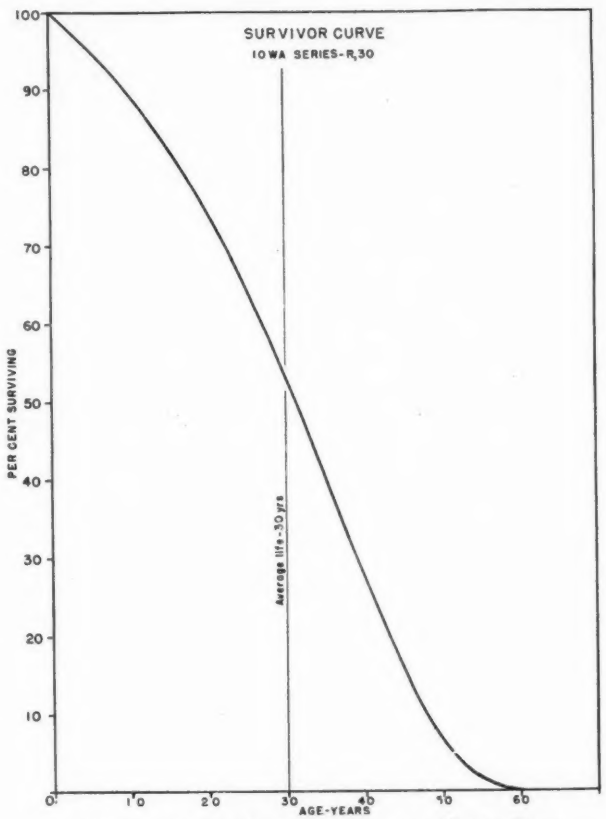

Fig. 1—General Survivor Curve for Utility Plant

However, we will see that we run into very large error by dealing with simple averages in depreciation. Why? Because some of the units in a group account which would appear to have identical life expectancy when they are installed will be retired well before the average life and some long after. This phenomenon is what we call "dispersion." Perhaps I can illustrate best by drawing two or three diagrams. These diagrams are commonly called "survivor curves" and give a graphical picture of dispersion. (See Fig. 1)

The vertical axis shows the per cent surviving at each age out of the original group, and the horizontal axis shows the age or elapsed time in years.

We also refer to these survivor curves as "mortality characteristics" because they presumably show the way the property has "died" in the past. The term is borrowed from life insurance actuaries' vocabulary.

Now armed with an understanding as to what we mean by some of these words —depreciation, age-life, dispersion, survivor curve, mortality characteristics— we will turn back a bit. Historically, there has been bitter opposition to age-life depreciation studies and the entire age-life approach in several quarters in the utility industry. This opposition

may have sprung from the fact that age-life depreciation as it has been applied has frequently produced unrealistic and excessive reserves as compared to existing reserves or as compared to engineering estimates of accrued depreciation. Many utility executives have been more willing to fight age-life depreciation than to try to understand it and to recognize the abuses that have been perpetrated in applying it.

Properly applied, age-life principles do not necessarily produce unreasonable reserves; moreover, they represent about the only approach to determining depreciation which is generally satisfactory to regulatory authorities. It is not an extravagant statement to say that most utilities are going to have to face some kind of age-life yardstick for setting up depreciation before too many years have passed. What the Depreciation Committee has been urging is that we should know as much about these methods as the regulatory authorities who are attempting to apply them, in some cases without understanding their frailties.

If we can meet the regulatory authorities on their own ground, we must understand the proper application of age-life methods.

What is it that is so helpful which has come out of recent research? The answer is that better methods of analyzing mortality characteristics in a broad field have led to the discovery that dispersion is greater than had been thought.

Let us now try to understand dispersion a little better. Keep in mind that we are talking only about group accounts. If there is no dispersion, that is, if all retirements occur at the average year, we have what is known as a square type Survivor curve. (See Fig. 2). On such a curve the age divided by the estimated life would represent the accrued depreciation percentage, assuming of course that we continue to ignore interest. But what is the situation when there is dispersion?

If we use the same approach of dividing age by life with respect to mass accounts we have ignored the fact that substantial retirements have actually taken place from the group and, in practical accounting, have been charged out against the depreciation reserve prior to the average life. It follows that a reserve requirement computed on the simple ratio of average age divided by life will *overstate* the reserve requirement by the amount of these early retirements. To make the matter even more clear, let us discuss another mortality curve which represents an extreme case. (See Fig. 3).

Now this curve represents what the survivors would be if the retirements are the same per cent in each year of the actual plant that remains in use, in this case 5 per cent. The curve is called the casualty curve, or pure chance curve, since under the assumptions which we made, age has no effect on the likelihood of retirement. We discover that the retirements in each year exactly equal the accrual for depreciation which is required. Under such conditions no reserve accrues and none is required. This represents an extreme case, as I said, at the other end of the scale from the square type curve.

We reach the general conclusion that the greater the dispersion (meaning the flatter the survivor curve) the lower will be the reserve requirement for a given age-life ratio.

With this explanation of the effect of dispersion, let us turn to the research work that has been going on to determine dispersion of utility property. How is dispersion determined? I will not answer that question here.

The Depreciation Committee in 1942 issued a treatise entitled "An Appraisal of Methods for Estimating Service Lives of Utility Properties." At that time that volume represented the latest knowledge on this subject. It is an extensive treatise. The volume showed, among other things, that at that time the actuarial methods were the only known methods to discover the dispersion shape. Only a few utilities have available the very extensive information required to make a determination of the shape of the dispersion curve, and even then they usually have these extensive data for only a few out of the total of their group accounts.

Therefore, depreciation engineers have been faced with this problem: they could not omit the effect of dispersion without seriously over-estimating the reserve requirement; they could not determine the shape of the dispersion curve. What they usually did do to avoid the substantial error from entirely omitting the dispersion factor was to estimate a curve shape and apply it. In most cases the estimate was a pure guess and frequently that guess was a steep curve with low dispersion, that is, a curve approaching the square type. Such curves produce high reserve requirements. If no dispersion adjustment is made this is equivalent to selecting a square type curve.

Now let us digress for a moment. In 1939, the Depreciation Committee started a research into the causes of retirements. They analyzed the figures of several companies over their entire history, going back to actual records of retirements, to determine the causes. The labor involved was tremendous.

They came out with the conclusion that approximately 80 per cent of the property studied had been retired for functional causes, not physical causes. Property was not worn out or rusted out; it was still physically usable; it was either obsolete or inadequate, or it had to be removed because of government orders, such as the requirement to go underground with a distribution system, or the widening of a road, or the like. This is a very important conclusion in its effect on dispersion. Let us review the functional causes of retirement to see why this is so.

Obsolescence is the first functional cause of retirement noted. It is determined by engineering study which must contain a large ingredient of executive decision. Property is obsolete when it is more economical to replace it with modern equipment than to continue to maintain and operate the old. Obsolescence was a major cause in the early period of utility development, particularly before 1930, because of rapid advances in the art during that early period. It has recently declined in importance as a cause of retirement because of a greater standardization of equipment, and the higher price level at the present time also comes in to affect the obsolescence equation.

The second major cause of functional depreciation is inadequacy. This cause is self-explanatory; growth of load makes it necessary to replace with larger capacity. Again the element of executive judgment comes into the picture. Note that these judgments in both cases, and particularly in the second case, are not related directly to the age of the property and they suggest that *chance* may have considerable to do with these reasons for retirement—chance unrelated to the age of the property.

The third major functional cause cited is the order of governmental authorities, and this cause of retirement is obviously in no way related to the age of the property and, again, from the statistical approach at least, is largely chance. We might expect, therefore, from these studies that the actual mortality curves of the utility property would show a considerable leaning toward the casualty or chance curve, which is a concave curve, as shown in the illustration. (See

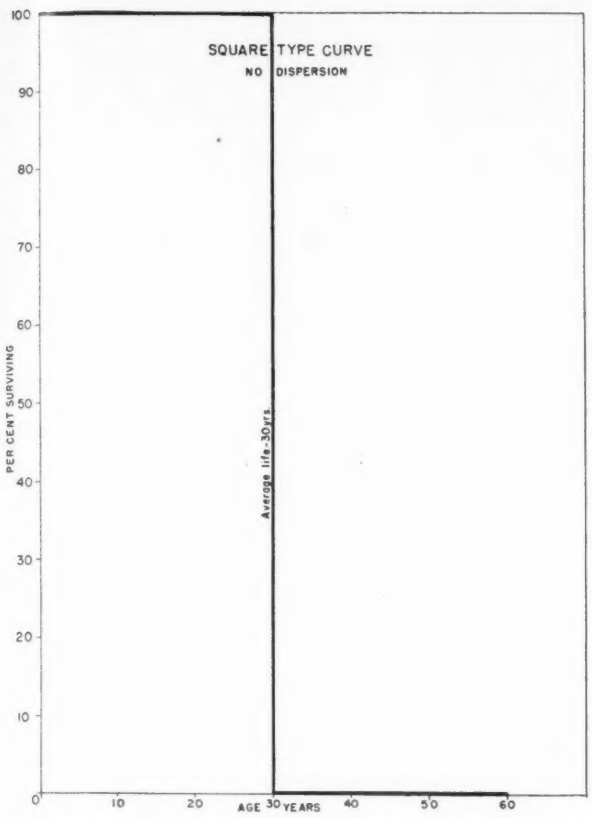

Fig. 2—Square-Type Survivor Curve

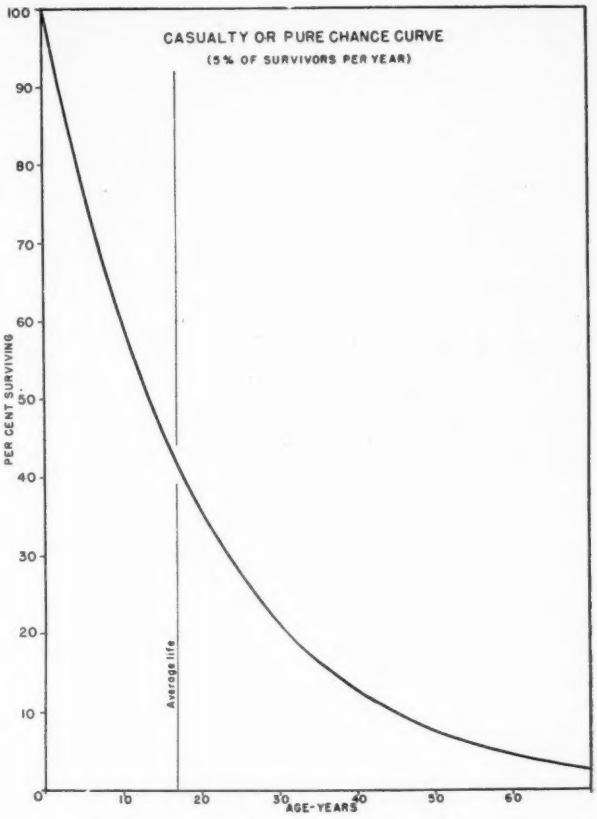

Fig. 3—Casualty or Pure Chance Survivor Curve

Fig. 3). This is the ingredient in the mortality picture which engineers failed to give enough attention to, that causes flatter curves than those that had been pretty generally estimated in the earlier studies of mass accounts.

There are other causes of retirement not related to functional causes that include casualty effect, such as lightning damage, affecting particularly transformers, and breakage, affecting transformers and meters. Breaking down poles by traffic accidents is another example. None of these physical causes of retirement is related to age and they also contribute to the casualty shape of the curve.

Looking backwards, one wonders why depreciation engineers did not suspect even earlier than they did that the steep curves which they were estimating were wrong.

Since 1942 when the "Appraisal of Methods" treatise was issued, there has been a new development in discovering mortality characteristics from accounting figures which permits an actual determination of the dispersion or mortality curve shape in a large number of cases without the detailed records heretofore held essential for determination by the actuarial method. This new technique is called the Simulated Plant Record Method.

The major work in developing the method was done by Alex Bauhan of Public Service Electric and Gas Company in Newark, New Jersey. Some of you undoubtedly heard Mr. Bauhan's excellent presentation of his techniques at the Buffalo meeting of the Accounting Section. Working quite independently, Henry Whiton of Gulf States Utilities Company, developed a similar procedure. Mr. Whiton also discussed his procedures at the Buffalo meeting. Paul Jeynes, also of Public Service Electric and Gas Company, outlined a further procedure at the Buffalo meeting that may have particular application in some cases.

I will not attempt to describe these new methods except to point out that they are all variations of one procedure; they consist in assuming a mortality curve, applying the curve to the gross additions for each year, and comparing the survivors or retirements computed by this means with the actual survivors or retirements. The trial assumption that comes closest to the actual figures is selected as the best representation of the dispersion curve.

It is obvious that all that is necessary is a record of the actual gross additions and the actual retirements or survivors at the end of each year over the history of the account. The important fact is that by this method of analysis we have been able to develop the facts of dispersion about a lot of property concerning which formerly we could only guess, and the facts so developed show much more dispersion than we had been estimating.

Another fact appears from these new studies and that is that there is no uniformity in the curve shapes for the same kind of plant located in different properties. This would lead the thoughtful student of the subject back to review the causes of retirement, and confirms the view that the attitude of the management about retirements of property in various locations, as well as a difference in physical conditions, has a profound effect on curve shape.

In the beginning I excluded interest from this discussion for simplicity's sake. I would say now that these same effects are equally present if interest is introduced into the depreciation computation.

I will conclude these remarks about dispersion and its effects with the briefest summary. The shape of the mortality characteristic drastically affects the size of the reserve of a group account. The reserve can vary all the way from zero to the full age-life ratio. The discovery of new methods of determining dispersion characteristics has brought us information that we were unable to get before and has shown us that mortality curves are flatter than we had supposed, with correspondingly lower depreciation reserve requirements.

So much for dispersion. I hope that what I have said will help to make its nature and its effects clearer to you.

I cannot resist mentioning a second factor affecting the size of the reserve and that is the question as to whether in applying age-life principles any allowance should be made for interest. This subject has been and is highly controversial within and without the industry. The NARUC discusses it at length in its several reports on depreciation policy proposed for adoption by the Association, none of which was ever officially adopted. They have taken a position in favor of straight-line depreciation and against the inclusion of the interest factor.

This position has been strongly criticized by engineers. Note particularly the official report of the American Society of Civil Engineers dated April 15, 1944, entitled *"Principles of Depreciation*—Report of the Special Committee Authorized by the Board of Direction to Analyze and Discuss the 1943 Report of the National Association of Railroad and Utilities Commissioners' Committee on Depreciation." Bear in mind that the engineer approaches the problem from a value standpoint and to him omission of the interest factor is economic nonsense. The whole utility industry is regulated on the basis of fair return on fair value and it seems inconsistent and illogical in any case to omit interest when computing one of the major factors in a fair-return computation.

My friends, knowing my weakness for this argument, will be amazed at the self-control I am about to exhibit by dropping this discussion at this point with the observation that the introduction of interest into the depreciation equation always reduces the reserve requirement and in most cases the annual charge also when applied to the average utility property. Quantitatively the introduction of interest frequently results in reduction of from one-third to one-half in the depreciation requirement as applied to a normal utility property where the interest factor is taken at the rate of return.

May I conclude these remarks with one more plea to the industry to give depreciation its proper weight and importance in the utility picture. Depreciation is a management problem; it is the responsibility of utility executives, not of technicians isolated from management responsibilities. Management decisions affect the life and curve shapes of the property. The elements of the depreciation problem are simple and should be clearly understood by those responsible.

Perhaps the most important thing to be learned from studying depreciation is that all the methods and routines used have weaknesses and are based on assumptions such as, for example, the assumption that property will be used and retired in the future on the same pattern as in the past. Depreciation figures relating to existing property are essentially estimates of future performance and should always be treated as such. Nor should the frailties of method and assumption ever be lost sight of.

However, in my humble opinion it will do no lasting good to fight age-life depreciation on the basis of its defects until there is developed a better method that is satisfactory to regulatory authorities and to responsible management officials. Both are looking for a simple authoritative answer or yardstick which probably does not exist.

"Jack" North Honored At Cleveland Electrical League Luncheon

MORE than 450 civic leaders, members of The Electrical League of Cleveland, League employees, and prominent persons in and out of the electrical industry from Cleveland and many sections of the country, paid tribute to J. E. "Jack" North on June 30 in the Grand Ballroom of Cleveland's Hotel Statler.

The occasion was the Silver Anniversary Luncheon sponsored by the officers and directors of The Electrical League in honor of Jack North's 25 consecutive years as its president.

General sales manager of The Cleveland Electric Illuminating Co., North is nationally prominent in the electrical industry, and has held many high national offices. During his presidency The Electrical League of Cleveland has become outstanding in the nation.

Speakers who lauded North's many contributions to the electrical industry included: Mayor Thomas A. Burke of Cleveland; Mayor William C. Dunlap of Cleveland Heights, a longtime friend of North; Elmer L. Lindseth, Cleveland Electric Illuminating Company president; W. G. Hills, president, International Association of Electrical Leagues, Washington; O. C. Small, of the National Electrical Manufacturers' Association, New York; H. L. Martien, president, Martien Electric Co. for the Electrical League's "Old Timers"; and L. D. Cleverly, a trustee of The Electrical Maintenance Engineers Association of Cleveland.

Toastmaster was William Ganson Rose, one of the original incorporators of The Electrical League in 1915.

L. T. Blaisdell, League vice-president, and General Electric Co. commercial vice-president, gave North a silverframed illuminated scroll, expressing the sentiments of the officers, directors and members of the League.

Blaisdell also announced the establishment of the J. E. North Award, as a tribute of North's pioneering in the industry. Beginning in 1948, the Award will be presented annually in Cleveland to an employee of a League-member company for outstanding contribution to the electrical industry. The Award will include a cash prize and a citation.

A silver electric clock, a gift from the League's officers and directors, was presented to North by W. L. Howlett, League vice-president, and branch manager of The Westinghouse Electric Supply Co.

A corsage was presented by Miss Katherine Doerrige, League employee with the longest service record, to Mrs. North for her interest in and active support of the League's activities over the years.

Improved Production with Electric Heat

By E. L. Kavanaugh

Senior Engineer, Power Sales Division, The Detroit Edison Company

A speech presented before the Industrial Section at a Pennsylvania Electric Association meeting at Hershey, Pa.

WHEN I was invited to speak on "Increased Production with Electric Heat," I accepted the assignment with some concern, feeling that there are any number of electric heating installations that do speed up the process, eliminate certain finishing operations, and increase the output of the plant. However, upon analysis, I found that I wanted to broaden the scope of my subject, for the benefits of electric heat are by no means confined to increased production rates. Since I am an ardent enough disciple of electric heat to refuse to be barred from discussing any of its advantages, I shall, with your permission, do a little rechristening and call this talk, "Improved Production with Electric Heat and How it Might be Accomplished," which title I believe will still be within the theme of this Conference, "Selling Efficient Industrial Production."

We all know that when a job is done electrically, shop working conditions are of the best. This is an important factor more so now than ever before because the major problem today in the operation of most every plant is labor. Electrification not only reduces costs by cutting down the amount of manual labor required, but makes the workers better satisfied because of the improvement in working conditions brought about by the use of electrical tools.

Electricity for More Machines

Back in the old days men worked 12 to 18 hours a day. They had to do this to get the job done within a reasonable time, as they had few and relatively inefficient tools to aid them. Improved tools were devised, most of them electrically driven, with the result that the electrical energy provided per worker in this country is more than seven times that used at the turn of the century. In the continuation of this trend towards greater electrification, lies industry's major hope of improving or even maintaining the economical production of the future.

You may ask, "What has all this to do with electric heating?" The answer is that in most cases electric heating will improve the conditions under which the employee works and it will do a better overall job. In fact, I don't know a better way of doing any heating job than doing it electrically—although sometimes the electrical method is higher in first cost and occasionally more expensive to operate, it will do a better job.

Although induction and dielectric heating are high in initial cost, they certainly reduce heating time and speed up processes. Infra-red certainly speeds up drying time and saves floor space, although it may not be a cure-all for every drying illness.

Induction Heating

Today the manufacturer feels the nudge of competition as a stimulus to improve working conditions and individual efficiencies as well as the quality of his product. If your customers' operations involve a heating problem, the solution may lie in electrical heating and the Power Man should be prepared to show him how to apply that method to his particular problem.

Suppose we take a look at the different types of electric heating, considering the more recent developments first. There is induction heating, for example, which has long been a dream of mine ever since 1922 when I first discussed with a General Motors Production Manager the possibilities of harnessing this source and putting it to work. At this early date we visualized the possibility of eliminating some of the cumbersome and inefficient heating methods which were then considered good practice.

But even as early as 1922 the *principles* of induction heating were an old story, and had already been adopted extensively for the melting of metals and widely used by the brass industry. It was not until the late 1930's, however, that equipment was developed for other uses, but thereafter, particularly in the war and postwar years, we witnessed a remarkable growth in the number of commercial applications throughout industry. Moreover, there is every indication that this growth will continue so long as there are heating jobs to be done.

The major growth in the use of this method has of course been in the heat treatment of steel—induction hardening as it is commonly termed—but it has also found use in the wood and plastic industries. Sometimes the original cost of installing the equipment is somewhat higher than the cost of comparable equipment, heating by convection or radiation, but the advantages more often than not, offset the higher initial cost.

The induction heating machine can be located directly within the production line and thus eliminate a great deal of handling, storage, and scheduling. Because of the high rates of heat input, scaling and decarburization cease to be difficulties. The heating machine almost simultaneously will generate uniform heat throughout the part to be heated or to the depth desired. Automatic timing of the entire heating and quenching cycle permits the use of untrained and inexperienced help. Once the proper cycles have been established, they are precisely repeated, eliminating rejects, reducing straightening and other costs, and sometimes permitting the use of the cheaper lower alloy steels.

The heating of nonconducting materials by this source, operating at a somewhat higher frequency, is equally efficient. New applications for both induction heating of metals and high-frequency heating of dielectric materials are appearing almost daily.

New Jobs for Induction Heating

A ring gear job that formerly took 2½ hours in an oil-fired furnace is now heating in 20 seconds. By heating the teeth only, a gear is produced that will withstand four times the normal expectation of engine-starter shocks, and there are fewer rejections because of warpage or other flaws. Another interesting new application is one on hardening piston pins. The induction hardening unit is hopper-fed, and nine operations formerly required were eliminated by the installation.

In the Forge Shop, die life is increased 300 to 400 per cent by the elimination of

scale; the induction heater reduces metal loss and is faster than fuel. No warm-up time is required and uniform clean heating results. Output "stays up" during the warm summer months. In one plant, pieces were heated in oil-fired furnaces and forged on an upsetter requiring a crew of four men to obtain a production of 85 pieces an hour. After the job was set up for induction heating, it was possible to secure a production of 190 pieces per hour with a crew of two men. These are but a few of many examples of what induction heating is doing, and you can find a great many others in your everyday studies of your own customers' heating problems.

Dielectric Heating

In the nonconducting materials field, the question of the ability of the high-frequency source to heat any particular material can be answered affirmatively with rare exceptions, such as heating of quartz, and one or two other similar materials. Determination of the practicability of an application, however, involves many more considerations and quite often *many important* advantages are found in addition to the increased heating rates obtainable.

A good deal has been written about the application of dielectric heating to plywood manufacture, in the bonding of panels and setting of the glue between the veneers. Since each veneer is brought up to temperature at the same rate and in the same time, so that expansion and shrinkages in adjacent veneers occur simultaneously, warpage in the finished panels is eliminated. Heating-up time for a particular block requires only 8 minutes with high-frequency power, as compared with several hours using convectional heated platens.

Probably the most fertile field for the application of dielectric heating has been and will be in the plastic industry. Plastics are ideal from the standpoint of dielectric loss, and at the same time demand uniform through-heating and short heating times. Because plastic resins, for example, have a relatively poor thermal conductivity, oven heating is much too slow.

In the textile industry, dielectric heating is used for setting of twist in rayon cord. "Foamex" mattresses are being heated by high-frequency in a rubber plant in 5 minutes, compared with 35 minutes by steam jackets.

Hard rubber wheels, which formerly took 5 hours, are being vulcanized in 18 minutes, and the time required for curing brake blocks reduced from 7 hours to 48 minutes. And so it goes, day in and day out one new application follows another.

I do not wish to creat the impression that dielectric heating can be applied indiscriminately to the heating of all nonconducting materials. Other heating methods show lower costs if dimensions, thermal properties and allowable time permit their use. It is when the limitations of these other heating methods are exceeded by the demands of the process that high-frequency heating should be considered.

Under these conditions, and if all factors are given their proper value in an overall analysis, high-frequency heating is usually successful because:

1. It offers increased speed with consequent saving in labor cost and/or capital investment in machinery.
2. It offers reduced number of rejects or general quality improvement.
3. It produces results which are unattainable by other heating methods.

Although the growth has been rapid, induction heating is still in the development stage and there are new tools and potential new uses to be found every day.

High-Frequency Tocco Heat Gun

One of the most recent is the use of portable inductors to bring the heat to the work rather than the work to the heat. There is the so-called Tocco Heat Gun—a portable hand-tool—controlled by a simple trigger switch utilizing the standard 10,000-cycle source. It is particularly adaptable to large cumbersome assemblies where many spot heats are required. Also it may be used on short production runs where it is uneconomical to provide a special inductor coil for each part to be treated.

The Induction Heating Corporation of New York compares its flexible lead and coil unit to the soldering iron or oxy acetylene torch. They have developed other ingenious designs for other specialized applications. Ohio Crankshaft has developed the 30,000-cycle Tocco machine which triples the previous high-frequency limit of motor-generator equipment. Although the past maximum frequency of 10,000 cycles has been generally satisfactory for heating parts over ⅜ in. in diameter, the new 30,000-cycle machine enlarges the range to include efficient heating of even smaller parts and better control of the hardening depths of larger parts.

There are indications that the continuous annealing of strip steel may become feasible with induction heating. Although to date, sufficient data has not been obtained to present a complete analysis of this application. However, preliminary tests indicate a possibility of putting this operation on a continuous basis, drawing the hardness of steel strip back to any desired value, depending on the speed of the strip and the rate of power input. In the laboratory, a steel strip with an original hardness of approximately 90 points (on the Rockwell B scale) was scanned by a high-frequency heating coil with a resultant hardness of 60-65 (on the same scale). Other samples have been fully annealed giving a final hardness of 35-40. Points at the very edge of the strip exhibited lowest hardness (about 10 points lower than center points) but it is believed that this spread in values can be materially decreased by changes in coil design.

Compact Design, Precise Controls

High-frequency heating lends itself ideally to this application because of the small space required, precise control speed, and the elimination of handling the steel into and out of batch furnaces.

Ajax Northrup-Thermonic (Girdler) and others are continually coming up with new ideas in this field. Electronic tube units are being improved somewhat but there is no indication that we can expect a reduction in first cost, which may continue to be an obstacle in the promotion of this equipment.

Sixty-cycle induction heating has been in commercial use for many years, and although it was found to be not too successful in the melting of steel, it has been almost universally adopted for melting by the wrought brass industry. During the war this sixty-cycle source was used extensively for expanding parts for shrink-fit assemblies, and it was used for shell-nosing operations on large caliber shells. It is being used for holding temperatures on extrusion dies and nozzles.

Each sixty-cycle heating unit must be individually designed and built for each heating task, and it is strictly a production heating tool, since the depth of current penetration is much greater than with higher frequencies. There are many other applications and its possibilities justify consideration, where pieces to be heated are of large diameter and localized heating is not of major importance.

We are doing a job of heating automobile brake drums to about 1200 F in

6.5 seconds with an average power input of 125 kw, and an average power factor of about 70 per cent. This permits a perfect bond between the steel drum and a thin layer of molten cast iron that is spun into the drum for superior braking surface.

Other experiments have been carried on, and we are now working on a job for heating magnesium slabs, 44 in. x 10 in. x 5 in., weighing about 250 pounds, to a temperature of about 850 F for a rolling operation. The coil will be large enough to accommodate three slabs, and will give us a heated slab at 850 F every three minutes, requiring about 1000 kva.

On a given production heating job, the sixty-cycle induction unit offers low first cost, high overall efficiencies, and normally the user's freedom from power limitations. He is not confronted with the necessity of using a 50-kw induction heating unit on a 2-kw job, nor is he faced with the impossibility of doing a 100-kw job on an existing 50-kw unit. The maximum power that can be put into a sixty-cycle induction heating unit is limited only by the size of the piece to be heated, and our ability to deliver power. It is a new field and should become an important source of revenue as the market is further explored.

Infra-Red Heating

Electric infra-red heating, another heat source, has come a long way since its birth, about 10 years ago, but its future is even more promising as manufacturers continue to improve oven design. Its steadily increasing popularity, however, should not suggest that it constitutes a cure-all for the heating engineers' problems, as is evidenced by the number of proposed uses for electric infra-red heating that never got beyond preliminary experimentation.

The most popular use for the infra-red oven is of course that of baking enamel on sheet metal, while moisture drying is a close second. Case histories indicate that moisture drying with electric infra-red has displayed advantages over other forms of heating where the moisture is held in a thin film of material. One such case is found in textile drying where infra-red is used for supplementing steam heating.

Section IV of the *Power Sales Manual*, Industrial Power and Heating Committee EEI, on Infra-red Heating is in the process of being revised and I hope it will soon go to press. It contains information on new applications, new tables, new up-to-date photographs, and suggestions for promotion of this market. I think that you will find it helpful and interesting reading.

One or two of the newer applications might well be mentioned here. Fostoria have recently come out with a combined spray booth and infra-red oven for baking the finish on completely assembled automobiles. Overall dimensions are about 23 ft x 10 ft x 7 ft. The maximum temperature in the oven is 200 F and with voltage control on different rows of lamps neither the window-glass nor the tires are affected. Bodies are completely baked in twenty minutes. The oven has a connected load of 47 kw and contains 432 lamps.

Almost every plant has a cleaning or degreasing job as the machined parts are prepared for the final application of protective coatings. Burn-off ovens or flame cleaning are undoubtedly the oldest methods known, but such methods have drawbacks such as required investment, time factor, space, and handling. Early attempts with low intensity infra-red ovens were not much more successful than the older convection ovens.

With the development of efficient, high intensity infra-red ovens, steps were taken toward the solution of the degreasing problem and the finding of still another application. It was realized that absorbed intensities of 30 to 50 Btu per sq in. per hour—9-13 watts per sq in. as against 4-7 watts, would bring sheet metal parts of 16 gauge up to 600 F in as little as ¾ to 1 minute, at which temperature oil and grease is burned off of the surface leaving only a fine residue.

This heating speed allows the handling of production on the same conveyor, carrying the work through its complete baking cycle, degreasing, coating with paint, and baking, without any intermediate handling. Possible similar cleaning applications may require close scrutiny to determine the feasibility of using infra-red, but it too is a new field in which to explore further the possibilities of infra-red heating.

Electric Melting Furnaces

There continues to be a good deal of interest in large heavy duty electric melting equipment. A number of furnaces having completed their war jobs have been resold and are now producing high quality metal in new surroundings. Specification engineers in heavy metal industries are demanding a greater number of their castings be made from steel melted in the electric furnace.

There has been very little change in the method of operation and the design of the furnaces, but steel foundries are doing some experimental work to improve production methods. In a number of steel foundries they are introducing raw oxygen into the molten bath and are finding out that they can reduce the carbon content of the steel much more rapidly without seriously affecting the other materials, i.e., nickel, chrome, silicon or manganese, and reduce the refining time from 20 to 30 minutes per heat. Indications are that the energy required per ton of metal melted may be reduced somewhat because the reaction following the introduction of the oxygen results in an immediate temperature rise. So far we do not have accurate data on the effect the use of oxygen will have on the total overall melting costs in a production foundry.

Getting New Foundry Customers

In the iron foundry, the electric furnace has proved itself an efficient tool, and with the present cost of coke, pig-iron, refractories, and labor, electric melting *cost* compares favorably with that of the cupola, and it offers better temperature and metallurgical control. Duplexing of gray iron has long been standard practice in some foundries, and during the past several months we have encountered considerably more interest by our larger foundry customers in this process.

In my own territory, two 3,000-kva units have gone in during the past 8 months, and two other plants are planning installations requiring 12,000 kw each. A study of the practices of your steel and iron foundries may enable you to sell those customers on the advantages of changing their present practices or adding to existing electric melting equipment, if and when you are able to serve them.

There is a natural temptation for the Power Man to go after the electrification of heating processes, in the order of their importance as a load, but experience has taught many of us that the growth and ultimate heating load in many plants is determined by the success of the first application, irrespective of the kilowatt capacity of the apparatus installed.

Many of you in this room do not have, as customers, large industrial plants where the potential electric heating market is most promising. You may say to yourself, "How can my Commercial Manager expect me to build up a heating load when the possibilities are so slim, and where it is out of the question to

sell power customers equipment that would add more kw's to the lines in the same proportion as in more industrialized territories?"

In one small plant in an outlying town that we serve, the Power Man sold the management on trying three small strip heaters on a dip tank where steam had been used for years. It worked, and a few months later all the other tanks were so equipped, and the load increased some 200 kw. Following on the heels of the 200-kw installation, the same type of installation was duplicated in another plant.

The Small Heating Job

This is not a success story, nor is it outstanding as loads go in these days, but it is typical of what is being accomplished in numerous plants, large and small. The problem is not confined to installation of only large equipment, but rather to selling the idea of electric heat to the greatest possible number of users. These small heating jobs turn up regularly and the load is both desirable and profitable. There are always uses for glue pots, low temperature ovens, melting pots and solution heaters. In chemical plants, there is need for processing new materials requiring temperatures *higher* than may be obtainable with their *existing steam* plant.

Invariably the process temperature increase can be obtained by electric heat with one means or another, at a cost which is considerably less than that required for changes in steam facilities. Thermostat control usually provides simple operating procedure with no additional operating labor required.

The same can be said for the electrically heated salt bath, and the general application of resistance heating in the treatment of all metallic parts—annealing, brazing, tempering or drawing, normalizing and carburizing. Each of these applications in itself would require a lengthy explanation, but the successful Power Man should acquaint himself with at least the fundamentals of each so that he can better serve his customers and his company. Time does not permit my describing them in detail, but we can say that they can be done and done better electrically.

I have said a good deal about induction heating, both high and low frequency. It is new, spectacular and efficient. I have said a little about infra-red drying, small heating applications, large melting and large heat-treating equipment. All of these markets will be sniped at by our competitive friends and we should be prepared to at least *hold* if not immediately improve our position.

As an example, one Gas Company representative stated recently that electric infra-red was a war development promoted by "those electrical fellows," installed in a number of plants for the emergency, and that it was all being replaced by gas. If my memory hasn't failed me, we had it before the war, we still have it, and we will continue to promote it.

In my own territory the gas people are extremely active, more so than ever before, which has stirred up a heap of interest. It is typical of what we can expect from now on as conditions demand a renewal of selling effort. That sort of thing is good for all of us. It helps shake us out of that satisfied, smug attitude in which we sometimes find ourselves.

Even though the power load today is close to available capacity, this industry of ours is not going to stand still—it just can't—it must either go ahead or slide back. In the Commercial Departments we hear about Planned Lighting Campaigns—Planned Programs for increased use of electric cooking, both domestic and commercial—better home lighting—more and broader use of our service. That is what *we should* be doing. The industrial market of the future offers greater possibilities, and I, for one, firmly believe that we should continue to build up a solid foundation of potential electric heating applications, develop new uses and take on the load to the maximum of our ability to serve. So I say, keep telling your customers of the advantages of electric heating, stay close to home taking care of your everyday duties, if you don't you may find someone else taking over.

Build a Backlog Now

I would like to warn you that someday your own Production Departments will be begging for load and you might have difficulty getting it unless you have built up a backlog of potential electric heating applications and general acceptance by your customers. So in closing I have a half dozen suggestions that may help you over that difficulty before the time comes:

1. Get set now with complete information and knowledge of all available heating equipment, their applications and sources of supply.
2. Stop blaming someone else for lack of excess capacity, and stop feeling sorry for yourself because of the present situation.
3. Acquire more knowledge of your customers' needs. Do the job as aggressively, if not more so, than before. He may, because of your efforts today, delay purchase of fuel-fired equipment until you are able to handle his load.
4. Remember that each new heating problem requires time to be properly engineered, and supposedly you have more time now than you will have in 1948 or 1949 when surplus capacity is available but maybe competition will be keener.
5. Remember that delivery of electric heating equipment is also slow and the installation may well be timed to fit your own ability to serve.
6. Keep remembering that if you wait until excess capacity is available to sell your customers on the many advantages of electric heating, it may be too late.

Theodore D. Crocker

THEODORE DOANE CROCKER, 68, president, Northern States Power Company, Minneapolis, and a member of the Advisory Committee of the Edison Electric Institute, died in Northwestern Hospital, Sunday, June 29, after a brief illness.

Mr. Crocker, native of Elyria, Ohio, went to Minneapolis in 1912 after having been associated with electric power companies in Cleveland and Milwaukee. His first position was as assistant to the vice president and general manager in Minneapolis of Northern States Power. In 1923 he became assistant general manager; vice president and director in 1931; vice president and general manager in 1942 and president and director in 1943.

Mr. Crocker, an officer of the Northern States Power Company since 1913, and its president since 1943, was the first president of the North Central Electric Association, 1920-21. He served on its executive committee continuously until his death.

Mr. Crocker was broadly identified with business and civic interest. He was a member of Gethsemane Episcopal Church, American Institute of Electrical Engineers, the principal clubs, and various civic organizations.

Five Years of Fatal Accidents in the Industry Point the Way to Prevention

By D. C. Stewart
Chairman, EEI Accident Prevention Committee

A speech presented before a joint meeting of the EEI Transmission & Distribution, Electrical Equipment and Accident Prevention Committees at Chicago, Ill.

THESE three Committees (Transmission and Distribution, Electrical Equipment and Accident Prevention) have met in joint session today to consider a subject which may seem to some to have the "sameness" and monotony of a much-discussed question. And yet, can we forget that day by day our subject of the hour—accidents—assumes a grim newness to many of our employees and to those whose well-being and happiness is linked with theirs?

The meetings of the Committees will extend over a three-day period. During that time, if our average should hold precisely, somewhere within the industry one of our employees will lose his life as the result of an accident and more than 40 others will suffer disabling injuries.

Somewhere, some person, burdened with the knowledge that "it didn't have to happen," will have to carry the news of that fatality to a shocked and grieved family, who must thenceforth adjust their whole mode of life and standard of living to a new and difficult condition. There's nothing hackneyed or monotonous about that situation. It's eternally new. We are well insulated from it here in this room, but it's very, very real out there where it happens. Those of you who have been through it can testify to that.

From year to year accidents in the industry have claimed on the average more than 100 lives and occasioned more than 5000 disabling injuries. The cost to the industry runs into many millions of dollars each year and the cost to employees and their families must run into additional millions in the way of reduced earning power and other expenses not covered by compensation payments.

Our Accident Prevention Performance, Past and Present

At the outset of any inquiry into the causes and cures for such a situation two questions come naturally:

1. How do we stand with relation to other industries in our accident prevention work?
2. How does our current performance compare with our past performance? Are we gaining ground, just holding our own, or are we losing ground?

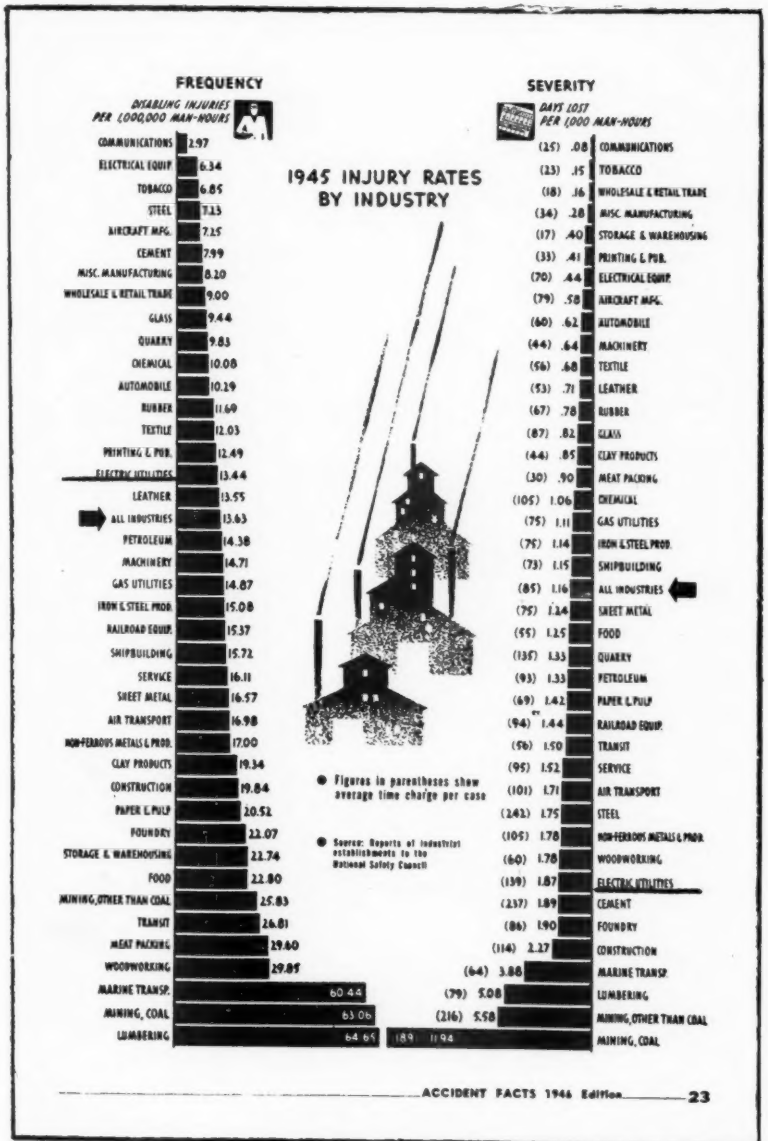

Fig. 1—National Safety Council Rating of U. S. Industries in Frequency and Severity of Accidents in 1945

Two charts will answer these questions.

Let us look at the first chart (Fig. 1) which gives the standings of industries in both frequency and severity rates for

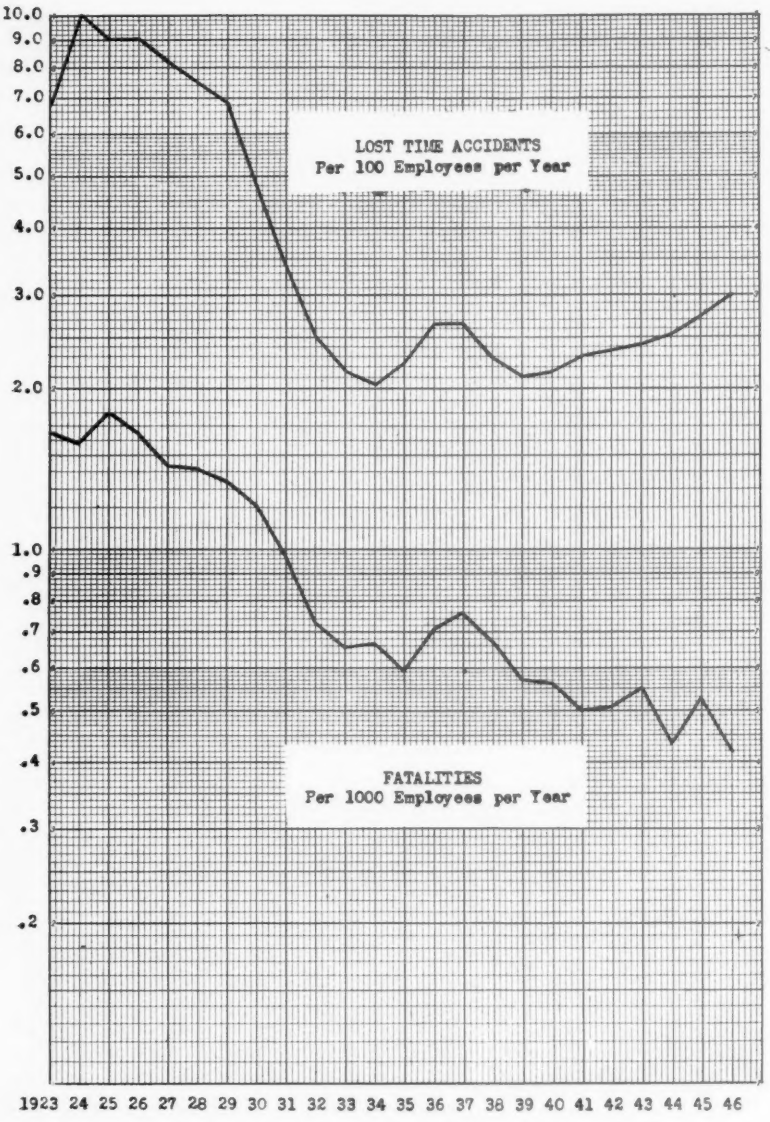

Fig. 2—Curves of Lost-Time Accidents and Fatalities from 1923 *to* 1946

1945, as reported by the National Safety Council. Electric utilities rank slightly better than average in frequency of injuries. However, we are much worse than average in severity of injuries. In fact we stand 33rd among 40 industries, and are exceeded in severity by only the cement, foundry, construction, marine transportation, lumbering and mining industries.

The reason is not hard to find. In 1945, 230 companies engaged wholly in electric operations reported time charges of 814,044 days. Of these 630,000 days, or 77 per cent of the total, were charged as the result of fatal accidents.

This percentage is considerably higher than in most industries. Clearly, we must do something about preventing these fatal accidents if we are to make any real improvement in our high severity rate. Fortunately the tools are at hand if we will but pick them up and use them. In the balance of this discussion emphasis will be placed principally upon this phase of the problem.

The next chart (Fig. 2) throws some light on our second question—how does our present performance compare with our past performance? Two curves are shown, Lost Time Accidents per 100 Employees per Year and Fatalities per 1000 Employees per Year. These are not the standard frequencies described above, since numbers of employees may be only roughly proportional to man hours worked. They are selected, however, because the data are available over a longer span of years, and are sufficiently reliable to show broad trends.

Remarkable reductions were effected in both rates between 1925 and 1933 or 1934. Thousands of injuries were prevented and hundreds of lives were saved. Similar curves for many other industries show a like reduction during this period. After a hump in both curves centering around 1936 and 1937, both curves turned downward until 1939.

Beginning in 1940 the curves parted company. Since then the lost time accident rate has climbed without interruption to the present time, until it now stands at a 15-year high. The fatality curve, on the other hand, after allowing for a few ups and downs, has shown a downward trend. But even so, as we have seen a few moments ago, it has not turned downward fast enough or far enough to place our industry in a favorable position with respect to other industries.

Without discounting for a moment the disturbing course of the lost-time accident trend or the necessity for doing something constructive to reverse it, the greatest problem before the industry in accident prevention is to turn this uncertain trend of fatality rates into a positive, sustained, downward movement.

Sources of Our High Severity Rate

Some five years ago the Accident Prevention Committee, aware of the cause of the industry's high severity rate, began the annual collection of detailed reports on fatalities occurring within the industry. We have had splendid cooperation from utility enterprises throughout the country. Responses each year have ranged from 90 per cent to 100 per cent of all fatalities. Results of our analyses have been published annually. A total of 557 detailed reports are now on file, covering fatalities occurring in the years 1941 to 1945 inclusive.

Mass statistical data of this kind permit identification with a high degree of reliability of the accident types, occupational groups, unsafe conditions and practices and other factors which are contributing most to our fatalities. With facts in hand on the how, when, where, who, what and why of accident occurrence, the way to progress becomes clearer. Some of the results of our study are given in the accompanying tables and charts.

Distribution of Fatalities by:

Fig. 3. Accident Types, Types of Work, Work Locations or Agencies

Fig. 4. Occupations and Accident Types (Transmission & Distribution)

Fig. 5. Occupations and Accident Types (Production—Generating Plants)

Fig. 6. Occupations and Accident Types (Commercial and Miscellaneous)

Fig. 7. Departments and Accident Types

Fig. 8. Ages of Persons

Fig. 9. Months and Accident Types

Fig. 10. Hours of the Day

Fig. 11. Years of Service with Company and Years of Experience at Kind of Work being Done at Time of Accident

With minor variation, the patterns revealed by this study are repeated from year to year. Thus, we can spot the places where this enemy we call accidents is concentrating in force. We can study the tactics he employs over and over again to injure or destroy our employees. But studies are of no use unless we use them to plan and take positive action against the enemy before he strikes again. How can we go about it?

We need only to glance at the figures to see that 17 out of every 20 fatalities occur in transmission and distribution and in electrical station work. The major part of the job must be done in these departments. Further, we note that electric shock and burn accidents account for seven out of every ten of the fatalities over the five-year period.

Year after year this ratio has held persistently at this level. We cannot make much progress in lowering that high industry severity rate unless we can do something about preventing electric shock and burn accidents.

Let's look a little closer at this accident type, both because it is outstanding and because we can get some idea of how to tackle the problem for other situations disclosed by this study.

Planning Our Attack

Accidents result from two things, unsafe conditions or working environments and unsafe work practices. There are enough of the first cause in the list of fatalities to show that the engineer can do much to help. Some of these accidents started back on the drafting board. Good head room, adequate "elbow room," good choice of equipment, clean cut arrangements and identification of circuits and equipment and an eternal awareness on the part of designers that

ACCIDENT TYPE	TYPE OF WORK AND LOCATION	RELATED DATA	1941	1942	1943	1944	1945	1941-45
ELECTRIC SHOCK OR BURN	LINE WORK ON POLES	PARTS OF BODY CONTACTED: Hands	17	16	13	9	14	69
		Head or Body	13	7	17	9	13	59
		Arms	4	9	3	5	12	33
		Legs or Feet	0	1	3	3	1	8
		Gaff Cutouts	5	4	1	0	1	11
		Slips, Loss of Balance	3	1	1	1	1	7
		Misc., Not Classified Above	10	12	3	6	1	32
	LINE WORK ON GROUND	Stringing or Removing Wires	7	1	2	0	1	11
		Energized Trucks, Booms	2	0	3	0	1	6
		Wires Down	1	0	1	1	1	4
		Poles, Handling Near Lines	1	1	0	2	0	4
		Guys or Steel Wires	2	0	1	1	0	4
		Insulation Failure, Pri. to Sec.	0	2	1	0	0	3
		Misc., Not Classified Above	1	1	2	0	1	5
	LINE WORK IN TREES		3	0	0	1	1	5
	LINE WORK ON LADDERS OR AT BLDGS.		1	1	1	2	1	6
	CABLE WORK UNDERGROUND		0	1	1	0	2	4
	AT STATIONS OR AROUND EQUIPMENT, STRUCTURES	Energized Leads, Risers, Cables	5	7	7	6	6	31
		Energized Buses	5	6	5	6	3	25
		Disconnecting Switches	3	5	5	1	11	25
		Circuit Breakers	0	1	2	3	3	9
		Lightning Arresters	1	1	2	1	1	6
		Current or Potential Trans's.	0	1	2	1	1	5
		Fuses and Fuse Boxes	1	1	1	0	0	3
		Compensators	0	1	1	0	0	2
		Potheads	0	0	1	1	0	2
		Reactors	1	0	0	1	0	2
		Misc., Not Classified Above	4	1	2	2	3	12
FALLS	LINE WORK ON POLES	Falling Poles	2	1	1	3	3	10
		Gaff Cutouts	3	2	1	1	1	8
		Slips, Loss of Balance	2	2	0	0	1	5
		Safety Snaps	0	1	0	1	1	3
		Misc., Not Classified Above	0	0	2	0	1	3
	LINE WORK IN TREES		0	0	3	0	2	5
	LINE WORK ON LADDERS		1	0	1	0	1	3
	STEAM PLANTS		1	7	5	1	3	17
	SUBSTATIONS		0	3	1	0	0	4
	HYDRO PLANTS		1	1	0	0	0	2
	MISC., NOT CLASSIFIED ABOVE		1	2	0	0	1	4
MOTOR VEHICLES	RAILWAY CROSSINGS	Struck by trains	3	2	1	1	0	7
		No trains involved	1	0	0	0	0	1
	HIGHWAYS	Collision, not at intersection	1	3	2	1	0	7
		Collision at intersection	2	0	0	0	1	3
		On foot struck by	1	3	0	1	1	6
		Vehicles left highway	0	1	0	0	1	2
		Thrown from vehicles	0	1	0	0	0	1
	FIELD STEAM PLANTS	Tractors overturned	0	0	0	1	2	3
			0	1	0	0	1	2
	MISC., NOT CLASSIFIED ABOVE		0	0	0	1	0	1
STRUCK BY OBJECTS	LINE WORK		3	5	3	2	2	15
	GENERATING PLANTS		1	1	4	4	3	13
BURNED	STEAM PLANTS		2	3	4	0	4	13
	LINE WORK		0	0	1	0	0	1
	PUMPING STATION		0	0	0	1	0	1
CAUGHT IN OR BET'N	STEAM PLANTS		3	0	1	1	3	8
	HYDRO PLANTS		0	0	0	1	0	1
DROWNED	GENERATING PLANTS		1	0	3	0	3	7
INFECTION	PLANT CONSTRUCTION		1	0	0	0	0	1
FUMES	ELECTRIC STATION		1	0	0	0	0	1
FROZEN	IN FIELD		0	1	1	0	0	2
SHOT	SUBSTATION GROUNDS		0	0	1	0	0	1
SILICOSIS	STATION		0	0	1	0	0	1
STRUCK AGAINST	STEAM PLANT		0	0	0	0	1	1
	SUBSTATION		0	0	0	0	1	1

Fig. 3—Distribution of Fatalities by Accident Types, Types of Work, Work Locations or Agencies, 1941—1945

TRANSMISSION AND DISTRIBUTION
(INCLUDING SUBSTATIONS)

	Electric Shock or Burn	Falls	Motor Vehicle	Struck By	Burned	All * Others	Total
Linemen	225	31	1	4	0	0	261
Electricians	36	1	0	0	0	1	38
Foremen	32	0	2	2	0	1	37
Servicemen	15	4	2	1	0	0	22
Laborers	9	0	2	2	0	0	13
Substation Operators	10	0	0	0	0	2	12
Troublemen	11	1	0	0	0	0	12
Groundmen	7	0	0	3	0	0	10
Substation Repairmen	6	1	0	0	0	0	7
Truck Drivers	4	0	3	0	0	0	7
Cable Splicers	4	0	0	1	1	0	6
Meter Testers	1	0	5	0	0	0	6
Linemen-Servicemen	5	0	0	0	0	0	5
Tree Trimmers	3	2	0	0	0	0	5
Managers	3	0	0	1	0	0	4
Engineers	2	0	1	0	0	0	3
Mechanics	2	1	0	0	0	0	3
Operator-Sup't.	3	0	0	0	0	0	3
Field Operators	0	0	2	0	0	0	2
Guards	1	1	0	0	0	0	2
Painters	2	0	0	0	0	0	2
Car Operators	0	0	1	0	0	0	1
Line Inspectors	0	0	0	1	0	0	1
Meter Installers	0	1	0	0	0	0	1
Meter Sup'ts.	1	0	0	0	0	0	1
Radio Engineers	1	0	0	0	0	0	1
Relaymen	1	0	0	0	0	0	1
Riggers	0	0	1	0	0	0	1
Service Representatives	1	0	0	0	0	0	1
St. Lamp Trimmers	0	0	1	0	0	0	1
St. Lt. Inspectors	1	0	0	0	0	0	1
Substation Cleaners	1	0	0	0	0	0	1
Tractor Operator	0	0	1	0	0	0	1
	387	43	22	15	1	4	472

* Other Types

Struck Against	1	Foreman
Frozen	1	Substation Operator
Fumes	1	Electrician
Shot	1	Substation Operator

Fig. 4—Distribution of Fatalities by Occupations and by Accident Types (Transmission and Distribution), 1941 – 1945

(PRODUCTION - GENERATING PLANTS)

	Falls	Burned	Struck By	Caught In Or Bet'n	Drowned	Electric Shock Or Burn	Motor Vehicle	All * Others	Total
Laborers	1	1	2	0	2	0	0	0	6
Maintenancemen	2	3	0	1	0	0	0	0	6
Auxiliary Operators	1	1	0	0	0	3	0	0	5
Engineers	2	0	0	1	0	0	1	0	4
Mechanics	0	3	1	0	0	0	0	0	4
Coal Handlers	1	0	1	1	0	0	0	0	3
Crane Operators	0	1	0	2	0	0	0	0	3
Electricians	0	1	1	1	0	0	0	0	3
Firemen	1	1	1	0	0	0	0	0	3
Foremen	0	0	2	0	1	0	0	0	3
Welders	2	0	1	0	0	0	0	0	3
Boiler Repairmen	0	0	0	0	1	0	1	0	2
Carpenters	1	0	0	0	1	0	0	0	2
Hoisting Engineers	1	0	0	1	0	0	0	0	2
Hydro Operators	0	0	0	1	0	1	0	0	2
Janitors	1	1	0	0	0	0	0	0	2
Watch Engineers	0	0	0	0	1	1	0	0	2
Watchmen	0	1	0	0	0	0	0	1	2
Ashmen	0	0	1	0	0	0	0	0	1
Boiler Operator	0	1	0	0	0	0	0	0	1
Camp House Boy	0	0	0	0	0	0	0	1	1
Car Cleaners	1	0	0	0	0	0	0	0	1
Conveyor Operators	0	0	1	0	0	0	0	0	1
Dredge Oilers	0	0	0	0	1	0	0	0	1
Dredge Operators	1	0	0	0	0	0	0	0	1
Governormen	0	0	1	0	0	0	0	0	1
Guards	0	0	1	0	0	0	0	0	1
Oilers	0	0	0	1	0	0	0	0	1
Oil Switch Inspectors	0	0	0	0	0	1	0	0	1
Operator - Sup'ts.	1	0	0	0	0	0	0	0	1
Painters	1	0	0	0	0	0	0	0	1
Results Engineer	0	0	0	0	0	0	1	0	1
Stack Repairmen	1	0	0	0	0	0	0	0	1
Stockman's Helpers	1	0	0	0	0	0	0	0	1
Yardmen	0	0	0	0	0	0	0	1	1
	19	14	13	9	7	6	3	3	74

* Other Types

Struck Against	1	Yardman
Infection	1	Camp House Boy
Silicosis	1	Watchman

Fig. 5—Distribution of Fatalities by Occupations and by Accident Types (Production-Generating Planes), 1941 – 1945

(COMMERCIAL AND MISCELLANEOUS)

	Motor Vehicles	Falls	Frozen	Total
Merchandise Salesmen	3	0	0	3
Meter Readers	2	0	1	3
Clerks	1	0	0	1
Collectors	0	1	0	1
Laborers	0	1	0	1
Lighting Consultants	1	0	0	1
Right of Way Men	1	0	0	1
	8	2	1	11

Fig. 6—Distribution of Fatalities by Accident Types and by Occupations (Commercial and Miscellaneous), 1941 – 1945

	Electric Shock or Burn	Falls	Motor Vehicles	Struck By	Burned	Caught In Or Bet'n	Drowned	All Others	Total	
									No.	%
Transmission, Dist.	387	43	22	15	1	0	0	4	472	84.7
Production (Gen. Plants)	6	19	3	13	14	9	7	3	74	13.3
Commercial & Misel.	0	2	8	0	0	0	0	1	11	2.0
No.	393	64	33	28	15	9	7	8	557	
%	70.5	11.5	5.9	5.0	2.7	1.6	1.2	1.6		100.0

Fig. 7—Summary of the Distribution of Fatalities by Departments and by Accident Types, 1941 – 1945

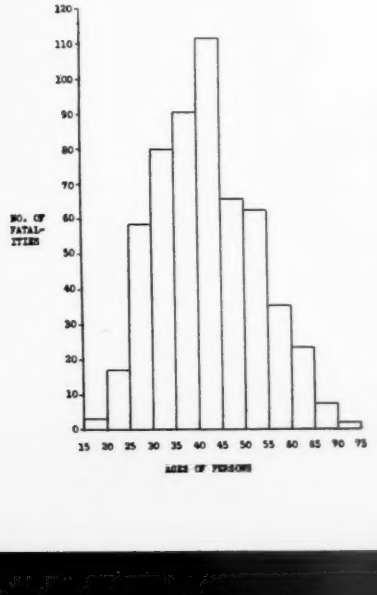

Fig. 8 — (Left) Distribution of Fatalities by Ages of Persons, 1941 – 1945

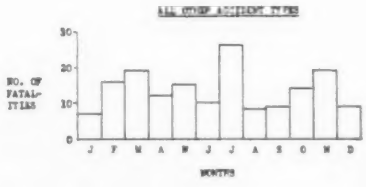

Fig. 9B—(Above) Distribution of Fatalities by Months of All Other Accident Types, 1941 – 1945

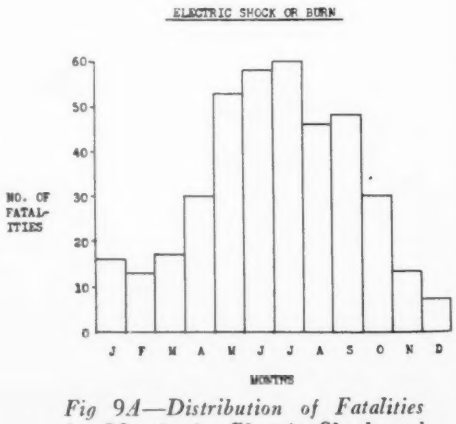

Fig 9A—Distribution of Fatalities by Months in Electric Shock and Burn Accidents, 1941 – 1945

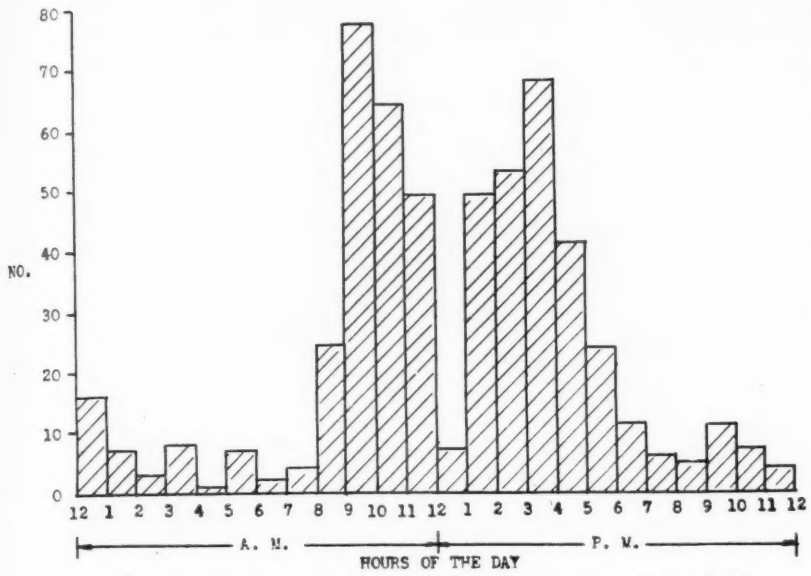

Fig. 10—Distribution of Fatalities by Hours of the Day, 1941 – 1945

YEARS OF SERVICE WITH COMPANY

YEARS EXPERIENCE AT KIND OF WORK BEING DONE	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	not given	total
0-4	126	38	8	11	7	1	1	0	0	0	192
5-9	8	59	11	5	2	2	1	0	1	0	89
10-14	8	4	33	15	5	1	0	0	0	0	66
15-19	5	1	1	60	10	3	0	0	0	0	80
20-24	4	2	3	3	35	0	1	0	0	0	48
25-29	1	0	0	1	1	6	1	1	0	0	11
30-34	2	0	2	1	0	0	7	1	0	0	13
35-39	0	1	0	0	0	0	0	2	0	0	3
40-44	0	0	0	0	0	0	0	0	1	0	1
	154	105	58	96	60	13	11	4	2	0	503
Not given	4	1	6	12	11	5	0	0	0	15	54
Total Reported	158	106	64	108	71	18	11	4	2	15	557

Fig. 11—Distribution of Fatalities by Years of Service With Company and by Years of Experience at Kind of Work Being Done at Time of Accident, 1941 – 1945

men must shape their work procedures to things as they find them will make work easier and safer for the men out on the pole tops and in the plants.

Do you design men make it a practice to get away from the office frequently and really spend some time out where serious accidents have been happening? If you haven't been doing this, try it! The fellows out there will not be a bit backward about giving you their views. Some of it may not seem too helpful to you, but a lot of it will be good, constructive criticism that will help you save lives.

Important as the control of unsafe conditions is, however, we find from our studies that more accidents result from unsafe work practices than from unsafe physical environments. Charles Kettering said, "Being physically present and mentally absent is one of the greatest causes of accidents." Another person put it this way, "You can guard a band saw, but you cannot fence off mental attitudes." The human factor will always loom large in the picture.

From studies of hundreds of these electrical fatalities, a list of principal unsafe work practices emerges. They are surprisingly few in number, but are repeated over and over again. Based on past experience, we can say with certainty that when the 1947 list of fatal electric shock and burn cases is in, most of the fatalities in this group will result from these unsafe work practices unless something more is done to prevent them than has been done in the past.

For every unsafe work practice there is a safe practice, and the safe practices which will prevent most of the fatal accidents on overhead line work or station work are shown in Fig. 12.

You will notice that there is nothing new on this list. These practices have been tested in the laboratory of experience and found to be good. Where they have been faithfully followed we have had few fatal accidents on overhead line or station work; where they have not been followed we have had many. It's as simple as that! Moreover, the adoption of these safe practices completely will involve no upheaval in work methods, no expenditures of vast sums of money, but simply their incorporation in established day to day work routines.

If the foregoing statements are true, why have not all companies within the industry moved promptly and vigorously to insure that these practices will be universally followed? There are doubtless many reasons, but one may predominate. Every violation of these safe practices is not followed immediately by a fatal accident. If it were, we should have strict adherence almost overnight. But the fact is that they can be, and are, violated many, many times in individual cases without untoward incidents. In fact, so high is the ratio between commission of these unsafe acts and resulting fatalities that individual gangs and even small companies can sometimes go on for years gambling with the lives of men without losing. Such a condition tends to build up indifference to the hazard, or even honest conviction that its importance has been overrated.

As we study these reports of fatal accidents, we in the Accident Prevention Committee have come to realize that we are in possession of unique knowledge.

We have a vantage point from which we can survey the industry and see what is happening, with a telescope more powerful than that possessed by individual supervisors whose horizons are limited to the happenings in their own companies, plants, departments or gangs.

We see disaster strike where these unsafe practices are being pursued, and then we see it strike again perhaps half a continent away. But in the meantime we see other men go on working elsewhere in the same unsafe manner, unaware that the sword hung suspended over their heads and that it did not fall because Fate elected to be generous with them for the moment.

How to make this story live throughout the industry is one of the biggest problems before us in accident prevention.

Safety and Production

Another factor of importance is that many supervisors still regard accident prevention as a thing apart, a hindrance rather than a help to production. This is a question which deserves the whole time at our disposal today rather than the few minutes we can allot to it.

One of the most illuminating things any operating man can do is to set down a list of things he must strive to do if he is to build an efficient, low cost, high productivity department with high morale; then set down the things he must do if he is to prevent accidents within his department. The two lists will look pretty much alike.

Yet men will short-cut in what they erroneously believe to be the interest of production. Some men are not averse to requiring that a primary job be completely rubbered when the application of protective equipment consumes 1 per cent of the overall time to do the job; yet the same men will take a chance and do the job unprotected when application of protective equipment takes 50 per cent of the overall time. When they complete the job unprotected without accident they feel they have made a profit in the interest of production, and are pretty sure to do the next job the same way.

If we could picture a system of bookkeeping over and above any that has yet been devised, this practice would be shown up for what it is. If every one of these unsafe work practices were charged with a red ink entry by which it bore its full share of the final disaster, the seeming "profit" from short cutting would show up for the loss it actually is.

ENERGIZED PRIMARY WORK

FOLLOW THESE SAFE PRACTICES AND PROTECT YOUR LIFE

1. "SIZE UP" THE JOB.
   Look job over, decide on safest working and climbing position.
   Size it up with the idea—you may cut out, slip or fall.
2. WEAR RUBBER GLOVES.
   Roll test your gloves.
   Put on before entering primary area.
   Wear them when handling parts that may become accidentally energized.
3. COVER SECONDARIES AND GROUNDS.
   Cover them when your head, arms, body, or legs could get across grounds and primary at same time.
   Cover nearest conductors first.
4. COVER PRIMARIES AND STREET L'TING.
   Cover when you can reach such wires or parts and they are, or might become "hot."
   Take a safe position.
   Guard against electrical contacts due to spur cut outs, slips, or mental lapses.

Keep rubber gloves on All the time you are in the primary area.

WORK ON *DEAD EQUIPMENT

1. DE-ENERGIZE—"KILL IT"
   Check Operating Diagrams.
   Watch for "back feeds".
   Be sure you have disconnected all power sources.
2. MARKUP
   Test.
   Ground.
   If you are working it "Dead", be sure it is "Dead"
3. MARK THE SAFE WORKING AREA
   Use flags, signs, tape and, if needed, lanterns, flares, flood lights.
   Before starting or resuming work Stop—Look—Think—is this the dead line or equipment
4. INSTALL BARRIERS
   Install when clearance to exposed live equipment is inadequate.
   On the short job, "Don't Skimp".

*Refers to lines or equipment normally operated at voltages above 300 volts.

SEVEN OF EVERY TEN FATAL ACCIDENTS IN THE ELECTRIC POWER INDUSTRY ARE DUE TO ELECTRIC SHOCK OR BURN.

Fig. 12—Text of a Pocket Card Summarizing Safe Practices for Avoidance of Electric Shock

The tie-in between efficient production and safe working methods is being recognized more and more, but there is still a long way to go. Let me cite just a few qualitative instances that have come to my knowledge in support of this point of tie-in.

Several years ago one company divided its line foremen into two groups, a low accident frequency group and a high accident frequency group. They found a high correlation between production and safety. The low accident frequency group had the higher production and the high accident frequency group had the lower production. Then they shifted the two groups of foremen between gangs. Production came up and accidents down in the gangs which had been under high accident frequency leadership, and the reverse was true in the gangs which had been under low accident frequency leadership.

The president of one company who keeps a finger closely on the pulse of his organization made this statement. "I have come to look on accident rates as an index of how a lot of other things are going in the plants and departments. The plants and departments that turn in the best performance in safety are the ones from which we get the best production, the lowest costs, the fewest grievances and the least trouble."

The president of another company, after reviewing 25 years of accident prevention work within his company, which has carried his organization to a position of leadership within the industry, concluded his remarks with these significant words: "I know of no other single activity in our company which has returned so much for so little."

For several years the Accident Prevention Committee has studied successful safety programs within the industry. Every company is a little different from every other company, and it is a healthy sign that there should be variations in the details of programs, because that is an indication that these differences between companies are being recognized.

But if we look for the one common factor in all successful programs we find managements, supervisors and workmen who honestly believe that accidents can be controlled, that it is good business for both company and employee to do so, and that this desirable objective cannot be achieved without a lot of hard work on the part of everyone.

We find that strong leadership must come from top management if the entire organization is to progress toward the goal. But we find too that, even where leadership at the top is lacking, cases of

(*Continued on page* 312)

Employee Information and Education

By Gerald S. Dailey
Indianapolis Power & Light Co.

A speech before the Indiana Electric Association, Young Men's Utility Conference, April 15, 1947

TODAY, we read and hear many varied opinions and proposals regarding a recognized need for employee information and education programs in industry in general and in the electric utility industry in particular. This in itself is important. However, what is being *done* in a concentrated effort to actuate a program of this kind is, quite naturally, more important.

The very fact that we are here shows that all the companies we represent are doing something about it, because the basic purpose of this conference is to broaden our knowledge of our industry and help us prepare ourselves for the future.

The question may be asked—"Why is there need for such a program of employee information and education?" or "Is it so necessary for employees, in general, to have additional information over and above that required to perform their routine daily jobs?"

The answer, without a doubt, is yes! I will attempt to set forth herein some of the reasons. We have but to consider three of the most important considerations which, I believe, necessitate the immediate application and full development of informational and educational programs for employees because:

1. We need to develop our personnel to the highest possible standards if we are to successfully meet present conditions and future opportunity for progress in our operations.
2. We need to create and maintain the best of public relations in order to gain the friendship as well as the business of those we serve, and
3. We need to defend the system of free enterprise, that has enabled our industry to become one of the greatest in the nation, and to combat the socialistic forces which threaten the privately owned and operated utilities.

Create Public Confidence

Cultivation of sound public opinion and good public relations is one of the most important tasks facing public utilities today. To a great extent what people think of the public utilities will determine the future of our industry. Engineering, operation, residential and commercial considerations are of utmost importance in the conduct of a public utility. All of these must be planned and carried on in a manner that will encourage our customers to use our service fully and to invest their money in our securities as is essential if our services are to expand.

The physical assets of our Company may be of great value and may make an impressive showing in an annual report, but the value of that intangible asset, the confidence and good will of the man in the street, is after all, the one great element which produces earning power and gives added stability to our Company.

Honest But Not Modest

Sound public opinion, good public relations, confidence and good will are dependent upon the character of the service rendered by our Company. Efficient operation, supplemented by reduction of rates as economies are effected, help to build up sound public opinion and good will. However, honesty of purpose and efficiency of operation are not in themselves sufficient to build up public good will. In the first place, unless our customers are fully familiar with what is being done, all of the accomplishments of our company will be of little or no avail in creating the confidence and good will which are so important in its development.

In the second place, customer good will is largely determined by the character of public contacts with our company's employees. Our management may provide adequate engineering, build up a high-grade technical and mechanical organization, reduce rates, and perfect all other impersonal elements, but all of these necessary factors in giving a complete service and in developing good public relations can be seriously discounted if the human organization, which means all employees, fails to recognize its responsibilities in building up good public relations.

Therefore, in order for employees to recognize their responsibilities in building up good public relations, it is indeed necessary to have a greater knowledge of facts and information concerning our own company and the electric utility industry in addition to that which is required to perform our daily tasks.

In considering ways to organize a well-rounded, practical and effective program for informing employees on matters of importance to them and our company, first consideration has been given to the three principal factors in such a program and what we have done about them to date. These factors are:

1. The *needs* of employees for various kinds of information.
2. The *employees* who are to be given the information, and
3. The *methods* of imparting the information.

Now, rather than speak in generalities, I believe it would be more interesting and helpful to you if I took a specific company and discussed the specific facts about its employee body and its methods of informing its employees. The company with which I am best acquainted, of course, is the company in which I work; and therefore I shall tell you something about the Indianapolis Power & Light Company information program.

I don't want to imply that I think its a perfect program or that it should be followed in other companies, because we are constantly trying to improve our own efforts and plans, and no two companies have exactly the same conditions to meet. But I can at least give you some idea of how our program has been set up and is being carried out, and that may suggest some ideas of what to do or not to do in your own companies. Let's consider first the employees and their needs for information.

The Needs

The desirability of having a well-informed employee body has long been recognized. In fact, under present and prospective personnel conditions, it is a necessity from the standpoint of company, employees and the public.

Only if the employee body is properly

informed can it keep the operations and public relations of our company at a high standard, maintain the satisfaction and ability of employees in their work, and render the superior service expected by the public.

Information is needed by our employees regarding (a) company operations, policies, plans, finances, history and management; (b) the employees' individual occupations, safety and activities of interest to other employees; and (c) the electric utility industry in general, since the major occurrences, trends and problems of the industry have an influence on our company and its employees.

The Employees

Some facts about the make-up of the employee body to be covered, in our particular program, are of interest in this connection.

As of January 1, 1947 our Personnel Division reported the following:

Active Employees:	
Men—1,162	
Women—200	1,362
Retired Employees	86
Military leave of absence	17
Total	1,465

Assuming that there are 4 persons in the average employee's immediate family, the number of individuals to be informed about matters of general employee interest is nearly 6,000. Add to this total the scores of friends and acquaintances of the individual employee, the total then amounts to thousands of people to be informed about matters of our company, its employees, and of the industry. Collectively, we as employees have thousands of friends and meet thousands of customers whom we can influence to think well or ill of our company and of the industry. Here indeed is an opportunity to widen measurably the number of people who understand what our company and what the industry represents.

The Methods

At present our company uses, or will use in the near future, practically all of the methods found in the successful employee information programs of other companies.

Our principal method of informing all employees and their families about our company and employee activities is through our employee publication, *Ipalco News*, mailed to employees' home so that not only employees, but members of their families will be well informed about the company. *Ipalco News* contains information about our company such as Operations, Policies, Plans and Finances; information regarding employee activities and safety.

Since our company's operations are concentrated in a small area and all employees live in the same community our employees have ample opportunity and occasion to meet often in various groups, meetings and activities. Therefore, information regarding the subjects just mentioned are given preference and considered more important than information of a personal nature regarding individual employees.

Information relating to birth, marriage and death, as employees are affected, are duly recorded and recognized as essential and desirable. Many of you are employed by companies that are spread over large areas. In that case, employee information of a personal nature would be most desirable in addition to company information because it helps employees in different localities to be better acquainted even though they can't meet very often.

Company News Services

In an effort to augment the regular issues of *Ipalco News*, we recently added an *Ipalco News Supplement*. The *Supplement* appears between regular monthly issues of *Ipalco News* and is designed and intended to contain current facts, bulletins or news regarding employee and company activities, plans, specific information, or any information that is desirable for, or pertinent to, a given time or situation. Later on, any or all information contained in the supplement can be elaborated upon in the monthly *Ipalco News* publication.

In other words, the purpose is to give employees important information as soon as possible, without waiting the full month between issues of the regular employee publication. As an example of our belief in the value of timely information to employees, a series of bulletins was issued during the two coal strikes last year, telling our personnel the exact status of our coal pile so they could give accurate information at once to anybody concerned.

In addition to *Ipalco News*, information pertaining to company operations is further disseminated by a booklet entitled "Electric Service Information," talks at meetings, Special Bulletins and Inspection Tours of major company properties. Our Ipalco Young Men's Forum, comprised of the young men of our company who are under 35 years of age, regularly conduct inspection tours of plants, offices and operating centers for all employees, their families and friends. Usually these tours of inspection are held during the evening hours when the majority of employees can avail themselves of this opportunity to learn more about our company operation.

It is planned, for the near future, to extend tours of this kind to include the general public so as to afford a better knowledge and understanding of the tremendous amount of equipment, property, planning, manpower, investment and responsibility required to render our service to our customers. Plans are also being considered to arrange a program whereby responsible employees will be regularly assigned to conduct special tours for school and civic groups, trade associations, business and manufacturers' groups or for any one interested in learning about our company and the industry.

Customer Contact Conferences

For approximately 180 of our employees, who regularly contact the public in their daily work, a Customer Contact Conference training program has recently been introduced. In these conferences discussions are held to improve wherever possible, our standard of employee-customer contacts.

Conferences are held weekly on company time of one-hour's duration, the present series consisting of 8 weekly meetings of each group. One employee from each group of approximately twenty persons is selected to act as the Conference Leader, keeping the conference on its course and leading the discussion. The Conferences are designed to:

1. Provide an opportunity for a friendly discussion of important factors concerned with satisfactory employee-customer relations.
2. Secure agreement on the best standard practice to use in dealing with all types of customers and customer problems.
3. Develop an understanding of the basic principles which under lie good public relations.
4. Develop a sense of responsibility on the part of each individual for maintaining a high standard of human service.

For information about utility developments of national interest the *Public Service Magazine* has been mailed to employee's homes for the last two years.

Other selected publications have also been distributed occasionally to all employees.

To augment our employee Safety Program a weekly bulletin entitled *Safety News* is issued. Facts and figures regarding accidents, as to the number, cause, reason and amount of lost time are contained in this bulletin. Such information is valuable and tends to make employees conscious of the need for safety, individually and collectively, in our every-day working and living conditions.

Information regarding the management of our company is regularly obtained in General Notices, Dept. Head Letters and Meetings, Foremen's Meetings and the Foremen's Manual.

Five special booklets have been planned for the information of all employees. One of these, on "Electric Terms," has been distributed. The other four, Company History, Employee Handbook, Safety Rule Book and Electric Service Information are now under preparation.

Employee Education Program

The annual report of our company offers an excellent opportunity to give company information to all employees and their families and the report of 1946 has been given to all employees.

Encouragement has always been given to employees of our company who desired to avail themselves of the benefits obtained from furthering their education in outside courses of study. In recognition of the time, effort and sometimes even sacrifice entailed in outside courses of study, the management of our company recently effected a program to recompense an employee so inclined.

To aid materially, as well as educationally, an employee is now reimbursed 50 per cent of the cost of tuition of an approved course of study upon satisfactory completion of the course. At the present time some of our employees are enrolled in courses of accounting, business law, shorthand, comptometry, steam engineering, mechanics, and a group composed entirely of Ipalco men are now enrolled in a refresher mathematic's course at Purdue University Extension, Division of Technical Institutes. This course carries four credit points in the Institute.

Prior to the war years, recently ended, employee classes in public speaking were regularly held and were probably the most successful we have experienced. It is now planned to resume these classes as a part of our educational programs.

A series of informative conferences for foremen and supervisors is regularly conducted. These conferences are usually dinner meetings and conducted and arranged so that each person's viewpoint or opinion can be expressed and considered for the enlightenment of fellow-employees.

Our employees' families are included when practicable at meetings (such as our Employees Christmas party and picnics) where informative talks and reviews about the company are given, and also at special inspections of company work centers.

Public utilities are governed and controlled by the public through its regulatory body, the Public Service Commission. As a matter of fact, the public actually is our "boss." Certainly, then, we have every reason to keep nothing from our boss; in fact we want to tell our "boss" everything we do: how we spend our money to improve our service, how we benefit the community in which we operate, how we contribute materially to civic and charitable organizations and *finally* how we improve and facilitate the economic and social pattern in the community in which we live and work.

When employees are properly and regularly informed they are better and more fully equipped to transmit favorable and adequate information to friends, associates, neighbors and customers. Mr. & Mrs. John Q. Public are told the true and ungarbled story direct from the ones who, from day to day, from month to month and from year to year, comprise the heart and soul, the very pulse itself of this vital, integral part of the physical and economical pattern of our nation.

Thus the public is told the true and unbiased story of our company and of the industry. They know us as we really are, what we stand for and what we represent. They understand our true value and importance in our community and in our Nation.

In Defense of Free Enterprise

Let us spend a few moments at this point to discuss the third consideration that I mentioned in the beginning—the need to defend our free enterprise industry against its opponents.

The changes that have been wrought in the social and economic life of the people of America by the electric industry are not a matter of accident or the result of natural growth. They are the outcome of ingenuity, sacrifice and ideals contributed by thousands of men and women whose individual impress is not discernible, but who have left their mark on the industry.

This joint effort in a common undertaking, marked by high moments of heroism as well as long hours of steady application to the daily task, creates a heritage that is part of the inner life of every individual associated with this great electric utility industry. To guard this heritage is another reason for employee information and education; for participation and cooperation in combating the dangerous forces that threaten our Companies, our industry and our Democratic and American way of life.

As we all well know, our industry is at the present time confronted with problems and conditions of national importance that have a direct bearing on all of us; not only as employees of a company in our particular area, or of the industry in general, but as citizens as well.

Give All the Facts

We have been well supplied with information and propaganda, on numerous occasions, extolling the virtues, the benefits, the economies and the many great accomplishments derived from such experiments as the TVA, the MVA and similar governmental projects.

But have we on these occasions been given the true, straightforward and factual information behind the picture painted for us by the advocates of government ownership of *all* utilities.

I believe we are all familiar with the methods and types of information behind the stories of TVA and MVA and similar projects. But are the true facts made known to employees of our industry so that we are prepared to defend, if necessary our system of private ownership and management?

Recognizing the important need of true information in this particular instance, our company some time ago distributed to our employees an 80-page study of the facts of the TVA entitled "Dangers of the TVA Method of River Control." This report was prepared from authentic data by Mr. Edwin Vennard, a man of high standing in the electric utility industry. Those of us who read and studied this report were clearly and conclusively shown the fallacies of such projects and the dangers and threats they present to our industry.

Following the report just mentioned a pamphlet entitled "TVA, Success or Failure" was distributed to our employees. This pamphlet was prepared

and compiled by Robert H. Knowlton, executive vice-president of the Connecticut Light and Power Co., and is an excellent expose of the false economic structure of the TVA and the resultant fundamental change in the American economy that would follow if similar projects became widespread.

While we may feel that we are removed from such encroachment because of our geographic location, we are apt to become complacent and feel that we are not seriously threatened. It is for this very reason that we should include this type of information in our employee program, to keep alert to the dangers, to prepare for the time when we may be forced to combat and to defend ourselves against any encroachment upon our privately owned and operated businesses.

Another, and certainly one of the most serious, condition of national importance pertinent to us as employees and citizens is the threat of Communism in our Country. Recently the employees of our Company were gratified to receive a copy of a report compiled by the United States Chamber of Commerce accompanied by a personal letter from our President, Mr. H. T. Pritchard, explaining the purpose for distributing this report to our employees. The report is "Communist Infiltration in the United States —Its Nature and How to Combat It."

The menace of Communism and the threat it poses to our heritage and liberty, to our children and to our beloved American way of life is clearly and unmistakably defined in this report. We are immediately aware of the duty of every one of us to expose and combat Communism whenever we detect the slightest evidence of its insidious existence.

I have endeavored to bring to your attention the need for various kinds of information to be given to employees in industry in general and in our utility industry in particular.

We, in our company, feel that we are making progress in our Employee Information Program and will continually strive to improve and enlarge upon our program. We do not feel that our method is the only manner in which to conduct a program of this kind. I have mentioned specific examples of our program with the hope that you may obtain some benefit, thought or idea to aid in your present program or a contemplated program for the future. If this has been accomplished I am indeed grateful for having this opportunity to impart to you the things we are doing in our Employee Information Program.

Connection of New Homes Still Proceeding At Record Levels

IN spite of the housing shortage and the difficulties encountered in procuring equipment and materials, the electric light and power industry is adding new customers at a rate only slightly lower than the record-breaking pace set last year, according to the Statistical Department of the Edison Electric Institute. During the first four months of this year, 543,150 new households were added to utility lines and, if this rate of 135,000 per month continues throughout the year, the 1,625,000 new homes connected during 1947 will constitute the second largest in the history of the business, being exceeded only by the 1,800,000 added in 1946.

Only one-quarter of these new customers are originating in cities, the reports of companies serving 26 of the larger cities indicating an annual gain of only 2 per cent, as compared with an average of 5 per cent for the country as a whole. In the rural areas, however, (which include communities of less than 2,500 population, "open country" and farms and comprise almost 10 million electrified homes or 30 per cent of the nation) the expansion both of housing and of utility lines has been large and has averaged 100,000 per month.

The following table shows this growth in electrification by the U. S. Census geographic divisions. The largest gain in new connections has been in the South and West, the increase north of the Potomac and east of the Mississippi having been relatively small.

Growth in the Number of Residential and Rural Customers

Geographic Division	*Number of Customers*		*Projection for 1947*	
	Apr. 30, 1947	*Dec. 31, 1947*	*% Inc.*	*Year's Gain*
New England	2,408,117	2,387,927	2.5	60,000
Middle Atlantic	7,336,431	7,283,630	2.2	160,000
East North Central	7,249,542	7,204,618	1.9	130,000
West North Central	2,958,849	2,894,884	6.6	190,000
South Atlantic	3,372,525	3,269,469	9.6	315,000
East South Central	1,624,807	1,574,736	9.5	150,000
West South Central	2,371,965	2,277,705	12.3	280,000
Mountain	971,867	941,672	9.6	90,000
Pacific	3,399,446	3,315,757	7.5	250,000
Total U.S.A.	31,693,549	31,150,398	5.2	1,625,000
Actual, 1946			6.1	1,800,000
All "Urban" cities*		21,500,000	2.0	425,000
All "Rural" areas*		9,650,000	12.4	1,200,000

Note: * "Urban" classification includes all cities with more than 2,500 population; everything else is "rural." This is a Census classification which has nothing whatever to do with "rural" electric customers (who are merely those carried on separate and distinct rate schedules.)

Water Heater Installation Manual

(*Continued from page* 287)

electric companies, which will ultimately mean lower costs and superior installations," Mr. Hartenstein declared. "The methods shown have been proven successful through use in many areas. We believe that this manual will be an effective guide to those companies now setting up appliance installation specifications."

The detailed preparation of the Manual was accomplished by a Technical Subcommittee of the Wiring Committee, Mr. Hartenstein said, which consists of H. R. Stevenson, The Detroit Edison Co, Chairman; F. E. Davis, The Commonwealth and Southern Corp., and J. M. Turnbull, Western Massachusetts Electric Company.

The Electric Water Heater Installation Manual is available from Edison Electric Institute, 420 Lexington Avenue, New York 17, N. Y., at 50¢ per copy. Additional copies of the individual diagram are also available, for distribution to contractors and dealers, at $3.00 per hundred sheets.

Utility Radio Organization Expanding

AT a recent meeting in New York of the Power Utilities' Radio Communication Systems Committee, which constitutes Committee 4 of the Radio Technical Planning Board Panel 13, reports were received from various representatives that associated Regional Coordinating Groups were now either organized or in process of organization in all sections of the country. The organization of Regional Groups has been fostered by the national committee which issued a "Generalized Plan for the Formation and Operation of Regional Utility Radio Coordination Groups" about two months ago (copies of this report are available on request to Mr. W. T. Smith, Room 2650, 420 Lexington Avenue, New York 17, N. Y.).

All groups are so constituted that representatives of Petroleum Pipeline Operators who are eligible under Federal Communications Commission rules to use the same frequencies as are available to Power Utilities, are welcome to participate with Power Utility representatives. This policy of direct coordination at local levels was agreed to be mutually advantageous at a joint meeting of representatives of the Power Utilities and of the Petroleum Pipeline Operators held in Chicago on June 4-5, 1947.

The successful future operation of utility radio systems will largely depend upon close cooperation among all licensees in this class of service, which includes electric, gas, water and steam utilities and petroleum pipeline operators. It is the function of these Regional Groups to promote this cooperation in various areas on such matters as the selection of operating frequencies so as to avoid interference. It is understood the Federal Communications Commission will recognize the objectives of these Groups by requesting each future applicant for a license to operate on a Power Utility frequency to secure a recommendation from the appropriate Regional Coordinating Group as to the specific frequency which should be used.

Companies contemplating the use of radio in their system operations will find it helpful to get in touch with their local Regional Coordinating Group for further information. Companies now using radio will also find such contact worth while, particularly as regards their plans to shift from their present temporary frequency to a permanent one.

"UTILITY RADIO ASSOCIATION OF NEW ENGLAND," *(R W Lewis, Chairman, Boston Edison Co., Boston, Mass.)* covering the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.	W C PHILLIPS New England Power Service Co 441 Stuart Street Boston 16, Mass.
"MIDDLE ATLANTIC UTILITY RADIO ASSOCIATION," *(G F Schiffmayer, Chairman, Public Service Electric & Gas Co., Newark, N. J.)* covering the states of New York, New Jersey, Pennsylvania (east of the Alleghenies), Delaware, Maryland and District of Columbia.	C S YOUNG Pennsylvania Power & Light Co 901 Hamilton St Allentown, Pa.
"NORTH CENTRAL STATES POWER UTILITIES RADIO COORDINAION COMMITTEE," *(R W Fackler, Chairman, Indiana & Michigan Electric Co., South Bend, Ind.)* covering the states of Pennsylvania (west of the Alleghenies), Ohio, West Virginia, Indiana, Illinois, Michigan, Wisconsin, Kentucky.	J G MCKINLEY West Penn Power Co P O Box 1736 Pittsburgh, Penna.
"UTILITY COMMUNICATIONS ASSOCIATION," *(J G Cavanaugh, Chairman, Iowa Power & Light Co., Des Moines 3, Ia.)* covering the states of Iowa, Missouri, Nebraska, Kansas, Oklahoma, Arkansas.	H W CHEW Empire District Electric Co Joplin, Missouri
"UTILITIES RADIO COORDINATING ASSOCIATION OF TEXAS," covering the state of Texas.	PAUL TAYLOR Central Power and Light Co 120 Chaparral St Corpus Christi, Tex.
"AREA B RADIO COMMITTEE," covering the states of North and South Dakota and Minnesota.	M K PATTERSON Minneapolis Gas Light Co 739 Marquette Avenue Minneapolis, Minn.

A list of Regional Groups now operating is shown above, together with the name of the chairman and also the name of the committee member with whom to get in touch on frequency assignment matters.

Information relative to Regional Groups and interim procedures in areas in process of organization may be secured from the following individuals:

For the states of Virginia, North and South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi and Louisiana: T. G. Humphreys, Jr.. Birmingham Gas Co., 1918 North First Avenue, Birmingham, Ala.

For the states of Washington, Oregon, Idaho, Montana and Wyoming*: W. A. Leidigh, Jr., Portland General Electric Co., 621 Southwest Alder St., Portland 5, Oregon.

For the states of California, Nevada, Utah, Arizona, New Mexico* and Colorado*: C. T. Malloy, Southern California Edison Co., 601 West 5th St., Los Angeles 53, Calif.

(* NOTE: The formation of an additional Regional Group to include New Mexico, Colorado, Wyoming and Southwestern South Dakota is under consideration.)

Accident Prevention Committee Meeting

D. C. Stewart, *Chairman*

THE thirty-fifth meeting of the Accident Prevention Committee was held on April 29 and 30 at the Edgewater Beach Hotel in Chicago, Ill., with about 35 members and guests in attendance. A joint session with the Electrical Equipment and Transmission and Distribution Committees was held during the morning of the first day. Details of this joint session are covered in the report on the Transmission and Distribution Committee which appears in the May issue of the BULLETIN.

E. J. Kreh presented preliminary accident experience for the industry for 1946 together with comparative final data for 1945. A summary of this data follows:

	1945	1946 (Preliminary)
Manhours	415,971,866	423,189,000
Fatalities	105	86
Frequency Rate	13.31	14.40
Severity Rate	1.96	1.73

The data also indicated continuation of the trend since 1939 for the lost time accidents per 100 employees per year to gradually increase while the number of fatalities per 1,000 employees decreases. It was suggested that the continual increase in lost time accidents may be due to reactions caused by the war. J. T. Bradshaw expressed the need for more careful selection of foremen and a greater emphasis on job analysis.

Analyses of Accidents

A. L. Dowden of the Liberty Mutual Insurance Company, presented further new analyses of fatal accidents resulting from electric shock or burn based on data from the Committee's annual analyses of fatalities for the five-year period 1941-1945. These consist of the classification of the 50 fatal accidents involving voltages over 6900 volts while doing line work on poles but excluding cutting out or loss of balance, the 125 similar accidents involving voltages under 6900 volts and the 96 fatal accidents at all voltages while doing line work on ladders, in trees and on the ground including cutting out or loss of balance on poles.

The eighth in a series of Information Exchange Bulletins edited by W. R. Smith was presented. This series of bulletins describes unusual accidents or those of special interest and the current issue is devoted chiefly to unusual accidents resulting from inadequate designation or safeguarding of work areas.

W. R. Smith presented a progress report on investigation of means of promoting greater caution on the part of operators of transportable booms, derricks, and similar vehicles. He revealed that a preliminary survey of individual company experience with this problem indicates some doubt that state laws will provide a solution.

New Manual Available

W. T. Rogers announced that the first in a series of accident prevention manuals entitled "The Use and Care of Pole Climbing Equipment" has now been published. A draft of the second in this series entitled "The Application and Care of Rubber Protective Equipment" has been reviewed by committee members and is scheduled for publication later this year.

C. N. Rakestraw announced that arrangements have been completed for reproduction of the accident prevention sound slide film on station accidents "Snake Eyes" and that copies will be available in the immediate future.

R. P. Douglas reported good progress on the survey of transformer tank grounding practices. Preliminary data indicates that practices vary according to voltage.

A general discussion of practical problems confronting the safety director was featured by presentation by W. F. Brown and R. M. Godwin both of whose companies have demonstrated outstanding ability in preventing fatal accidents over the five years during which studies of fatalities have been made. Mr. Brown described the safety organization of his company and outlined the safety program which has been particularly effective in maintaining a significantly low rate of electric shock burn fatalities. A broad educational program includes regular meetings of supervisors, periodic lectures and demonstrations to all employees, wide distribution of safety literature and the distribution of all electric shock accident investigation reports to supervisors. Electric operations are performed according to procedures contained in a general manual governing all work on electric equipment and Mr. Brown emphasized that no rules are included which cannot be enforced. Regular inspections of all plants and properties as well as field inspections while work is actually being performed are made to eliminate hazardous conditions and work practices.

Mr. Godwin also described the safety organization and program of his company which included a similar broad educational program, the use of detailed work practices for all operations and frequent inspections. He also reported the widespread use of contests and awards to stimulate interest in safety.

Further progress in coating rubber gloves with Neoprene to reduce corona cutting was reviewed by T. R. Claffy of W. H. Salisbury and Company. Additional tests conducted on original samples of coated gloves at several utility company laboratories under various test procedures have confirmed the corona cutting resistance of the Neoprene coating. More recent samples produced have improved flexibility and appearance indicating a closer approach to the goal of a glove possessing all of the qualities of natural rubber gloves but with corona resistance as an added feature.

Advantages of Cooperative Self-Training Indicated

E. E. Beck presented the results of a study of employee training programs of companies represented on the Committee. He stated that cooperative self-training appears to be the method best suited to fulfilling the desired objectives. This type of training can take place in organizational units and does not require the leadership of a man especially trained in this respect. It permits trainees to discuss their work problems and facilities coordinating individual efforts into a group effort. It is not only an accident prevention measure but also accomplishes an operating objective by providing a vehicle for work planning.

A round table discussion of miscellaneous items revealed considerable diversity among companies in the practice of hot line maintenance. Several companies utilize hot line tools for maintenance at all voltages, some use gloves at the lower distribution voltages and hot line tools at the higher voltages while others deenergize all higher voltage lines for maintenance.

PERSONALS

The Board of Directors of the Philadelphia Electric Company has announced the election of HORACE P. LIVERSIDGE as chairman of the board. He has been president since 1938, and will continue as executive head of the company.

MR. BRYANS

MR. FUNK

Concurrently, Mr. Liversidge announced that H. B. BRYANS, executive vice-president was elected president, and that N. E. FUNK, vice-president in charge of engineering was elected executive vice president and a member of the board of directors.

Mr. Bryans, newly elected president, was born and educated in Philadelphia, and is a graduate of the University of Pennsylvania. He has spent his entire career in the public utility business, beginning with the Philadelphia Gas Works Company. Later he continued in the gas field in Kansas City, Mo., and natural gas in Kansas. He first entered the electric utility field in Gloversville, N. Y., and later became engineer of the Counties Gas and Electric Company in Norristown, Pa. He was subsequently appointed general superintendent and later assistant general manager of the Philadelphia Suburban Counties Gas & Electric Company. In 1929 he was named vice president in charge of operations of the Philadelphia Electric Company, and was elected executive vice president in 1938.

Mr. Bryans is a director and past president of the American Standards Association, president of the Electrical Association of Philadelphia, director of the Edison Electric Institute, and a past-president of the Pennsylvania Electric Association.

He is a director of the First National Bank of Philadelphia, of The Midvale Company, a director and a member of the executive committee of the Bellevue-Stratford Hotel, a member of the board of managers of the Western Saving Fund Society of Philadelphia, and a vice president of the Union League of Philadelphia. He is also a trustee and a member of the executive board of the University of Pennsylvania.

Mr. Funk, newly elected executive vice-president, was born in Bloomsburg, Pa., and is a graduate and a trustee of Lehigh University. He started his business career with the Westinghouse Company and later taught at the Georgia School of Technology. He has been with the Philadelphia Electric Company for many years, and is a national authority on engineering matters.

Mr. Funk has been active in the affairs of many important national associations and societies, including the American Institute of Electrical Engineers, of which he is a past national president; the American Society of Mechanical Engineers, of which he is now a vice-president; the Association of Edison Illuminating Companies; the Edison Electric Institute; the Pennsylvania Electric Association; and the Franklin Institute.

T. E. ROACH, of Portland, Oregon, vice-president and general manager of the Northwestern Electric Company, has been named executive vice-president and general manager of Idaho Power Company.

The announcement was made following a meeting of the company's directors by C. J. STRIKE, who was re-elected president and chairman of the board.

"Mr. Roach comes to Idaho Power Company with experience in the electric industry dating back to 1915," Mr. Strike said. "He and I were associated together in the management of the Northwestern Public Service Company at Huron, S. D., in 1923 and 1924. Since that time he has held management positions with other electric companies in various parts of the nation.

"Roach was associated with the National Electric Power Company in New York from 1925 to 1932, and later became chief executive of the Washington Gas and Electric Company at Tacoma, Wash. Since 1942 he has been vice-president and general manager of the Northwestern Electric Company at Portland.

"Since Idaho Power Company is now engaged in the largest program of expansion in its history, my own time must necessarily be spent with matters of financing and development. As executive vice-president, Mr. Roach will be in charge of operations of the company."

Mr. Strike also announced the election of J. H. ROGERS of Boise as vice-president of the company and his re-election as treasurer. Other re-elections at Thursday's meeting include A. C. INMAN, vice-president and secretary; G. E. BARNARD, assistant treasurer; and E. A. ANDERSEN, assistant secretary.

Honorary life membership in the Northwest Electric Light and Power Association was awarded to 13 Northwestern pioneers in the electric industry at the Association's annual meeting in Vancouver, B. C., June 27, 1947. The recipients, now mostly retired from their companies, had been prominent organizers, executives, engineers and sales people.

Heading the list in point of age and early service with the industry was DR. EDWARD C. KILBOURNE of Seattle, who was among the first organizers and operators of electric utilities in that city in the 1880s and 90s.

Among the engineers and operating men honored were R. R. ROBLEY and CHARLES P. OSBORNE, Portland General Electric Company, and GEORGE E. QUINAN, Puget Sound Power and Light Company, who contributed much to the

technical development of the industry in the Northwest, beginning in the 1900s.

WILLIAM G. MURRIN, former president of B. C. Electric Railway Company, represented the top executive element of the industry. In the next executive level was A. M. CHITTY, in the industry for 56 years, most of them spent as division manager for Puget Sound Power & Light Company, and LEWIS A. LEWIS, assistant general manager of the Washington Water Power Company.

Mr. Lewis' work as sales manager for the company and his electric range survey of the 1920s was recalled in his citation. FRANCIS H. MURPHY, for many years illuminating engineer and consulting engineer for Portland General Electric Co., also represented the sales group, while WILLIAM H. UDE, Washington Water Power Co., was known chiefly for his work in employee and public relations.

Four pioneers of the wholesaling and jobbing fraternity during the past 40 years or so were: J. IRVING COLWELL, Northwest District Manager, and JAMES H. KELLY, sales manager of Graybar Electric Company, Seattle; HARRY B. ROGERS, manager of the Spokane branch, G. E. Supply Corp., and J. A. KAHN, manager of the Rocky Mountain division of G. E. Supply Corp., Salt Lake City, all now retired.

The resolution by which these men were elected called attention to "the qualities of leadership, of technical and professional abilities, of broad vision in bringing together all phases in the industry into cooperative effort, of participation in civic affairs and community growth, and of initiative and courage in taking the risks of pioneering a major enterprise of this region."

FRANK H. HUGHES has been named Director of Purchases of the United Light and Railways Service Company succeeding the late W. H. FAHRNER, purchasing agent. Mr. Hughes is widely known in the utility field, having been associated with the North American Light and Power Company and its subsidiaries since April, 1919. Starting as a clerk to the vice-president and general manager, he handled special assignments, purchased all insurance carried by six subsidiary companies.

During this period (from 1919 to 1926) he was associated with the Illinois Power Company, Decatur; the Missouri Power and Light Company, Jefferson City; the Iowa Power and Light Company, Des Moines; the Kansas Power and Light Company, Topeka; the Central Terminal Company and the Illinois Terminal Railroad Company, both of St. Louis.

In September, 1926, Mr. Hughes was appointed director of purchases. In this capacity he supervised four district purchasing agents and storekeepers, and purchased all equipment, materials and supplies used in the construction, maintenance and operation of electric, gas, heat and transportation facilities, and water and ice plants owned by North American. He served as a director of the Missouri Power and Light Company and vice-president of the Central Terminal Company, participating in the management of other subsidiaries.

Mr. Hughes is a native of Chicago, was graduated from Lane Technical High School, and has taken special courses at De Paul University as well as work in electrical engineering and accounting.

W. P. MCARDLE retired on July 1 as consultant with the Ebasco Services Incorporated, following 21 years' association with that company and the Electric Bond and Share Company system.

A graduate of the University of Pittsburgh, Mr. McArdle was associated with railway and utility companies in the Pittsburgh area prior to joining Ebasco. Mr. McArdle was active for many years as a member of EEI Committees on purchasing, stores, and stores accounting.

Appointment of JACK P. LEWIS of Stamford to be Director of Engineering of The Connecticut Power Company, has been announced by Allan D. Colvin, Executive Vice-President. Mr. Lewis is now Assistant to the Manager of the Stamford Division of the Company.

He is a graduate of Stamford High School and was graduated from Rensselaer Polytechnic Institute in 1930 as electrical engineer. In 1933 he received a degree as doctor of electrical engineering from Rensselaer. He first entered the employ of Stamford Company while a student, and upon completion of his college training returned to the company's service. In 1940 he was put in charge of electrical engineering in the Stamford Division, was promoted to Division Engineer in 1942, and was made Assistant to the Manager in 1943.

WALTER N. NELSON has been appointed to succeed Mr. Lewis in Stamford. He attended the University of Illinois and Rhode Island State College, graduating with a B. S. degree in civil engineering.

Upon graduation Mr. Nelson was associated with Stone and Webster Engineering Corporation as field and office engineer on the construction of power and industrial plants until joining the Connecticut Power Company in 1935. He has been Division Engineer in Stamford since 1943.

ROBERT H. PEARSON, Supervisor of Personnel of The Connecticut Power Company, has assumed the duties in connection with personnel work in the Stamford Division formerly carried out by Mr. Lewis.

KENNETH L. PARTRIDGE has been appointed assistant superintendent of engineering in the engineering department of the Hartford Electric Light Company.

Mr. Partridge was born in Edinburg, New York. He graduated from Rensselaer Polytechnic Institute in 1921 with a degree of electrical engineering. He entered the employ of the Hartford Electric Light Company immediately after graduation and has held positions as engineer in the engineering department, engineer in the distribution department and distribution engineer.

WILLIAM G. BURRILL, Sales Manager of the Staten Island Edison Corporation, Staten Island, N. Y., retired on July 15, completing 33 years in the utility business.

Mr. Burrill started his utility career in 1914 with the Bangor Hydro-Electric Company, Bangor, Maine. He was Commercial Manager of that firm when he resigned to take up his work on Staten Island. He came to Staten Island in 1926. Since that time he has been actively engaged in the promotion and sale of electrical appliances through his own organization and dealers. Due to his efforts the local firm enjoys a saturation in electrical refrigerators of over 80 per cent, one of the largest in the eastern part of the United States. He organized many cooperative dealer activities and was the founder of the Staten Island Electrical League. For the past eight years he has been the chairman of the Board of Directors of that body.

Upon his retirement the employees of the company, the Electrical League and

other representatives of the industry honored him with a testimonial dinner.

Appointment of J. NORTON EWART as chief mechanical engineer of the Buffalo Niagara Electric Corp., Buffalo, N. Y., has been announced. Mr. Ewart, who has been superintendent of production for the company, succeeds C. C. WHELCHEL, who is resigning to join a utility in California in August.

As a result of Mr. Ewart's promotion, two other appointments involving the management of C. R. Huntley steam stations were announced. FRANKLIN S. HELFTER, who has been assistant superintendent of the Huntley stations, becomes superintendent and WILLIAM G. GODFREY, assistant to the superintendent of Huntley, becomes assistant superintendent.

Mr. Ewart has been associated with the Buffalo utility since 1929 when he started as an assistant field engineer. He has served as assistant superintendent and superintendent of the Huntley stations. In his capacity as a field engineer, Mr. Ewart had much to do with the erection of the 75,000 kw and the 160,000 kw additions to the steam-electric generating facilities at Huntley. In 1939 he succeeded the late D. H. Scranton as superintendent of the stations, and in 1945 he was named superintendent of production for the company.

Mr. Helfter became identified with the company in 1923 and Mr. Godfrey in 1929.

Mr. Whelchel has been with the company since 1939 when he started as assistant chief mechanical engineer, becoming chief mechanical engineer two years later.

HAROLD S. METCALFE, who was elected president of the Public Utilities Advertising Association at the recent convention in Detroit, is widely known in the electrical industry, in advertising and in the field of public relations.

A graduate of Ohio Wesleyan University, Mr. Metcalfe has been connected with West Penn Power for more than 20 years and at present occupies the position of advertising manager.

For 13 years he served as chairman of the advertising committee of the Pennsylvania Electric Association and, at present, is chairman of the Business Development Section of that association.

WALTER H. SAMMIS, president of Ohio Edison Company, has been nominated to the board of trustees of Columbia University to serve until 1954. Mr. Sammis will serve as alumni representative on the board.

JULIUS C. MEIER, manufacturing editor of *Electrical World*, has been appointed western editor with headquarters in Chicago to succeed FRANK E. SANFORD, who leaves *Electrical World* to become director of research and development for the Copper Wire Engineering Association.

Mr. Meier joined the editorial staff of *Electrical World* in 1944 following an association with the Western Massachusetts Electric Co. that covered more than 10 years. A graduate of Clarkson College of Technology, Potsdam, N. Y., Mr. Meier entered the Westinghouse test course in 1930, three years later becoming identified with the central station department of the Western Massachusetts Electric Co. in station operations. Subsequently he engaged in domestic and industrial service and then transferred to sales and sales promotion, relinquishing these duties to enter the hydro department. During the last year of his association with the utility company, he occupied the position of system operator and load dispatcher.

Mr. Sanford will establish headquarters in Chicago and will be responsible for a program of testing and laboratory research for improved performance of copper-type conductors. He is also to cooperate with operating utilities, with various committees and with hardware and fitting manufacturers on the development of devices and accessories.

Prior to joining *Electrical World* in March, 1946, Mr. Sanford was superintendent of distribution engineering of the Cincinnati Gas & Electric Co. He was chairman of the Edison Electric Institute transmission and distribution committee in 1943-45 and a member of two EEI-NEMA joint committees, standards for distribution transformers and preferred voltage ratings. He is the author of "Electric Distribution Fundamentals," published by McGraw-Hill Book Co. in 1940 and of numerous articles and papers on distribution.

GORDON EVANS, formerly president of the Missouri Edison Co. and the East Missouri Power Company, is now assistant to the president of the Kansas Gas & Electric Company, Wichita. Mr. Evans entered upon his public utility career in 1924 with the Public Service Co. of Oklahoma at Tulsa. A subsequent connection was with the Oklahoma Power & Water Company, which he served in the capacity of secretary and treasurer and later vice-president before he joined the Missouri Public Service Co. in 1937 as vice-president and secretary, rising to the position of operating vice-president. It was in 1941 that he became president of the two Missouri utilities.

Pennsylvania Water and Power Company, Baltimore, has announced the election of GEORGE W. SPAULDING, vice-president, to the position of executive vice-president and of DONALD GUNN and J. U. DIEHL as vice-presidents. All of these men have been with the company for many years.

Mr. Spaulding is also a director of the company. Mr. Gunn has been chief engineer of the company and his duties in this capacity continue.

Mr. Diehl has been treasurer of the company since 1944 and continues to handle those duties.

Designation of L. E. KARRER to the position of executive vice-president of Puget Sound Power & Light Company and its subsidiary companies has been announced recently. Mr. Karrer, vice-president of the company since 1942 and manager of North Coast Transportation Company since 1939, has had long and varied experience in the electric utility field.

Mr. Karrer became identified with the company in 1927 as a meter tester in its Seattle offices. In line with his engineering background he became, successively, a student engineer and assistant engineer with the company's engineering department. In 1931 he was made assistant to the vice-president. In succeeding years he was promoted to positions of greater executive capacities.

During the war period Mr. Karrer represented Pacific Northwest industry on various governmental control boards, and is a member of the Northwest Electric Light and Power Association. He is serving on the Board of Trustees of the Seattle Chamber of Commerce and is chairman of the Chamber's industrial committee, now actively engaged in encouraging the establishment of new industry in this area.

Appointment of L. A. WILLIAMS, vice-president, as manager of the central division with headquarters at Seattle, succeeding FRANK WALSH, who becomes manager of the southern division, has been announced. These changes

(*Continued on page* 312)

were brought about because of the retirement of A. M. CHITTY, long-time southern division manager. Mr. Williams, who continues as vice-president in his new managerial capacity, joined Puget Power in 1934 as assistant to the president.

The Way to Accident Prevention

(Continued from page 302)

safety can emerge from deserts filled with indifference and accidents where some supervisor decides that, regardless of what the other fellow may or may not be doing, the men in his department, plant or gang shall not be injured unnecessarily.

Somehow, if progress is to be made, more of the men who are doing the front line work of the industry in field and plant must become filled with that kind of determination, and such improved tools for accident prevention as have been developed from these studies must be placed in their hands. Strong leadership is needed from above to bring this about. It is because we believe that an important part of that leadership is contained in the membership of the Transmission and Distribution and Electrical Equipment Committees that we have brought this discussion to you. The statistics indicate impersonally, but with undeniable finality, that the prevention of fatal accidents is principally the problem of the departments you represent.

In this year of the Thomas A. Edison Centennial, we have been reminded that one of the great inventor's most important discoveries was the so-called "Edison effect." It remained no more than an interesting discovery until some one found that a little bit of wire or grid, interposed between the filament and plate of a tube could release and control power many times in excess of the small input to the grid, even though the grid was only a small part of the whole assembly.

We are few in number here today compared to the quarter million people employed throughout the industry; but do not underestimate your power to help! If every person present goes back to his company and does more for accident prevention than he has ever done before, the "flow" of these lifesaving conditions and work practices into the every day operations of our industry will be immeasurably increased.

You can in fact become a "grid in the tube." You will find that your increased interest and participation in accident prevention will be multiplied many times as others are stimulated to greater effort by good example and strong leadership.

What will your part in the effort be?

CONVENTIONS AND MEETINGS

1947

SEPTEMBER

5-6	Management Conference, Wisconsin Utilities Association, Hotel Northernaire, Three Lakes, Wis.
5-11	National Electrical Contractors Association, San Francisco, Cal.
8-9	Accident Prevention Committee, EEI, 420 Lexington Ave., New York, N. Y.
15-19	Illuminating Engineering Society, Roosevelt Hotel, New Orleans, La.
17-19	Indiana Electric Association, French Lick Springs Hotel, French Lick, Indiana
22-24	Meter and Service Committee, EEI, and Meter and Service Methods Committee, AEIC, Lord Baltimore Hotel, Baltimore, Md.
22-24	Northwestern Section, International Association of Electrical Inspectors, Eugene Hotel, Eugene, Ore.
25-26	Accounting Section, Wisconsin Utilities Association, Dell View Hotel, Lake Delton, Wis.
25-26	Southeastern Electric Exchange, Fall Conference Engineering and Operation Section, Henry Grady Hotel, Atlanta, Ga.
25-27	Southeastern Electric Exchange, Engineering and Operation, Henry Grady Hotel, Atlanta, Ga.
29-Oct. 1	—Purchasing and Stores Committee, EEI, Henry Grady Hotel, Atlanta, Ga.
29-Oct. 1	Southwestern Section, International Association of Electrical Inspectors, Mission Inn, Riverside, Calif.

OCTOBER

6-7	Prime Movers Committee, EEI, Benjamin Franklin Hotel, Philadelphia, Pa.
6-7	Electrical Equipment Committee, EEI, Benjamin Franklin Hotel, Philadelphia, Pa.
6-8	American Gas Association, Annual meeting, Cleveland, Ohio.
6-8	Association of National Advertisers, Atlantic City, N. J.
6-10	35th National Safety Congress and Exposition, Chicago, Ill.
7-8	National Farm Electrification Conference, Claypool Hotel, Indianapolis, Ind.
8-11	International Association of Electrical Leagues, Statler Hotel, St. Louis, Mo.
9-10	Transmission and Distribution Committee, EEI, Benjamin Franklin Hotel, Philadelphia, Pa.
13-15	Western Section, International Association of Electrical Inspectors, Mount Royal Hotel, Montreal, Can.
15-18	American Society of Civil Engineers, Fall Meeting, New Orleans, La.
20-22	Eastern Section, International Association of Electrical Inspectors, Seaside Hotel, Atlantic City, N. J.
21-23	American Standards Association, Waldorf-Astoria Hotel, New York, N. Y.
27-29	Southern Section, International Association of Electrical Inspectors, George Washington Hotel, Jacksonville, Fla.
27-30	National Electrical Manufacturers Association, Hotel Traymore, Atlantic City, N. J.
29-31	Southeastern Electric Exchange, General Sales Conference, Atlanta Biltmore Hotel, Atlanta, Ga.
30-31	Pennsylvania Electric Association, Electrical Equipment Committee, Benjamin Franklin Hotel, Philadelphia, Pa.

NOVEMBER

3-7	International Lighting Exposition, Stevens Hotel, Chicago, Ill.
19-21	Joint Convention of Gas & Electric Sections, Commercial & Technical Divisions, Wisconsin Utilities Association, Schroeder Hotel, Milwaukee, Wis.
21-22	New Jersey Utilities Association, Seaview Country Club, Absecon, N. J.

DECEMBER

1-5	The American Society of Mechanical Engineers, New York, N. Y.
3-5	52nd Annual Congress of American Industry, National Association of Manufacturers, Waldorf-Astoria Hotel, New York, N. Y.

JANUARY

26-30	American Institute of Electrical Engineers, Pittsburgh, Pa.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

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